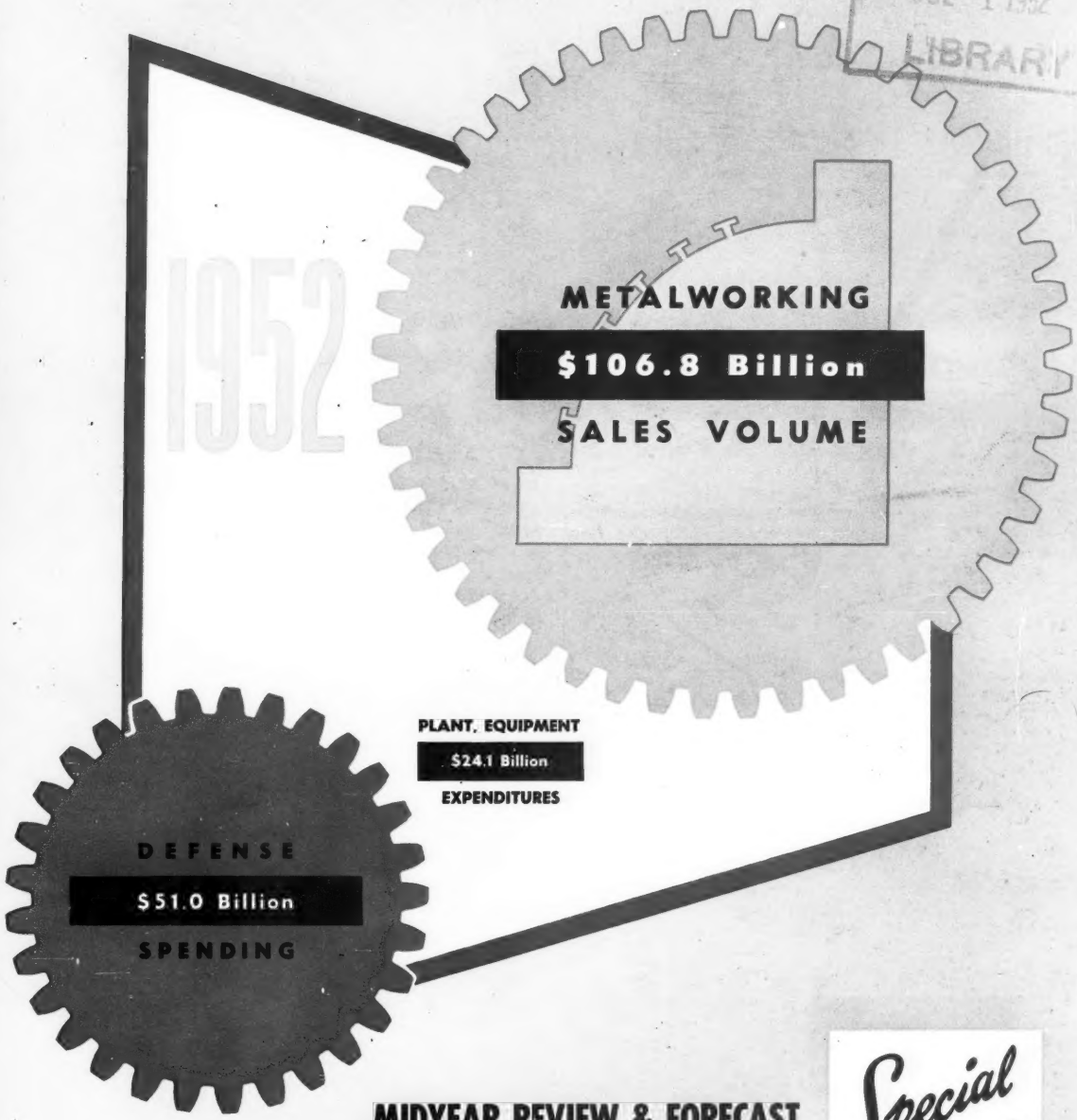
JUNE 30, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

OHIO STATE UNIVERSITY
JUL - 1 1952
LIBRARY



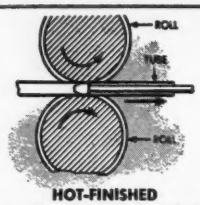
MIDYEAR REVIEW & FORECAST

Business Gets Acclimated to High Altitudes

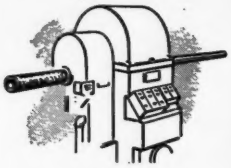
—opposite page 50

Special Report

CONTENTS — PAGE 5

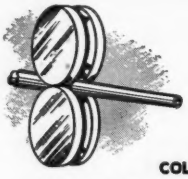


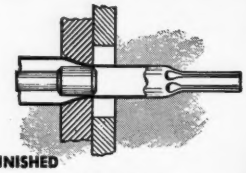
HOT-FINISHED
bears the scale formed during hot fabrication or heat treatment.



TURNED
machined, uniform O.D.

take
a closer look at
YOUR
Finishing Time

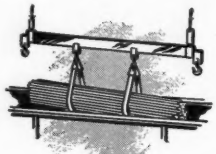




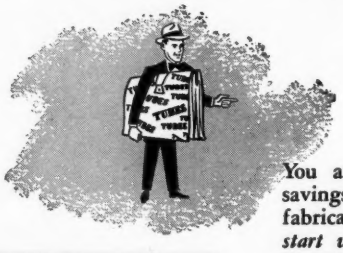
COLD FINISHED

ROTO-ROCKED
Smooth surfaces, obtained by special sizing and finishing processes.

COLD DRAWN
Smooth, scale-free surface.



PICKLED
de-scaled by one of several solutions.



You aren't taking full advantage of the time savings and cost economies in the machining and fabrication of hollow parts from tubing *unless you start with tubing having the* ***PROPER SURFACE FINISH.***

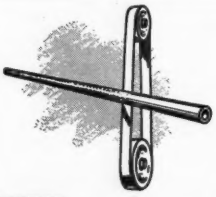
By specifying tubing having a surface finish keyed to your production methods, you take an important step toward reducing the time it takes you to make your finishing operations.

As a specialty tube mill, B&W supplies mechanical tubing in the variety of surface finishes illustrated.

Your choice should be influenced by your production facilities and consideration of the cost differentials among the several finishes.

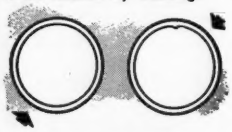
In any case, remember that the tubing *you* can use is more than merely bar stock with a hole in it.

It can be delivered to you as a product ready for you to convert—in the shortest possible time and with least cost—into your finished product. Mr. Tubes—your B&W Tube Representative can help you select the tubing and finish most suitable for your specific end uses.



POLISHED
O.D. and/or I.D. polished to one of several specified degrees of smoothness.

FLASH-IN
ERW tubing which retains the bead formed by welding.



FLASH REMOVED
ERW tubing, bead-free.
Both available either as welded or normalized.

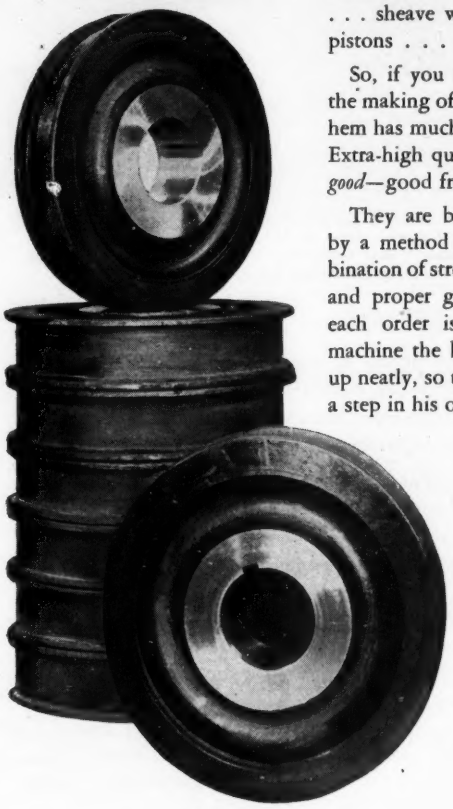
THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 19, Texas • Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1690M

The steel blanks with an almost endless *VARIETY of USES*

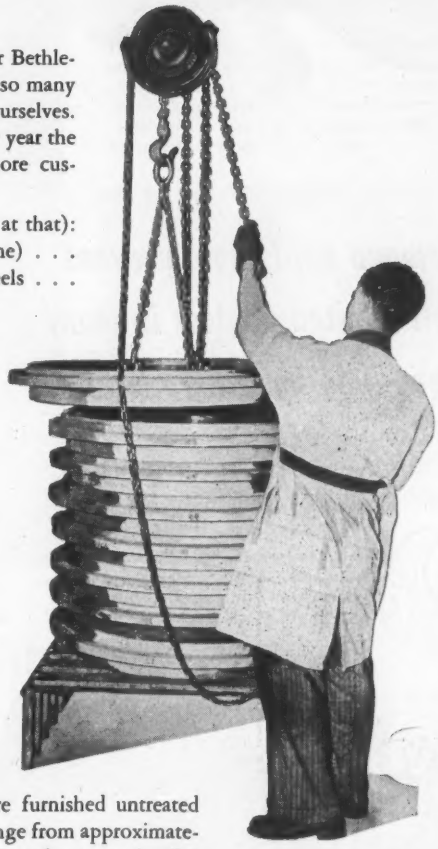


There are so *many* uses for Bethlehem circular steel blanks—so many we may not know them all ourselves. But we do know that every year the number grows larger, as more and more customers find new applications.

Here's a partial list (and very partial, at that): Gears (spur, bevel, miter, herringbone) . . . crane-track wheels . . . industrial wheels . . . turbine rotors . . . flywheels . . . motor brake wheels . . . clutch drums . . . sheave wheels . . . locomotive pistons . . . tire molds and rings.

So, if you require steel blanks in the making of your products, Bethlehem has much to offer. Nice variety. Extra-high quality. These blanks are *good*—good from rim to rim.

They are both forged and rolled by a method that produces a combination of strength, uniform density, and proper grain flow. And before each order is shipped, we rough-machine the blanks and clean them up neatly, so that the customer saves a step in his own plant.

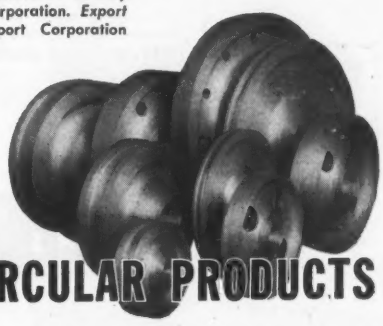


Bethlehem blanks are furnished untreated or heat-treated; sizes range from approximately 10 to 42 in. OD. Care for more details? We'll gladly supply them at your convenience.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

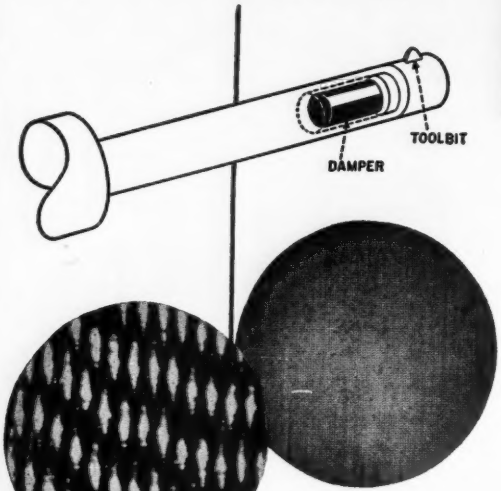


BETHLEHEM ROLLED-AND-FORGED CIRCULAR PRODUCTS

Here's How Heald helps you get a finer finish on long-bore parts

On this Heald Model 221 Bore-Matic, damped quills help prevent self-excited tool chatter marks in the finish of long interrupted cuts. The parts, valve control bodies for ordnance work, are two-way borized, with the finish cut on the out stroke of the table.

damped quills help prevent self-excited chatter in many deep-hole borizing operations



The above photographs, magnified 8 times, show a chattered work surface (left), compared to a similar surface when borized by a damped quill. Quill dimensions in each case were identical.

● When the nature of the work requires boring bars and quills of unfavorable length to diameter ratio, self-excited vibration often causes objectionable chatter which is practically impossible to control by ordinary methods.

Heald engineers have developed an effective solution to this problem by combatting the vibration at its source — right in the quill itself. An air-cushioned plug or "damper" of heavy material, inserted into the work end of the quill has proved remarkably effective in reducing chatter on quills whose length-to-diameter ratios range from 3.5:1 to 8:1.

If you have a deep-hole borizing problem, this may be the answer. Remember — when it comes to precision finishing, it pays to come to Heald.

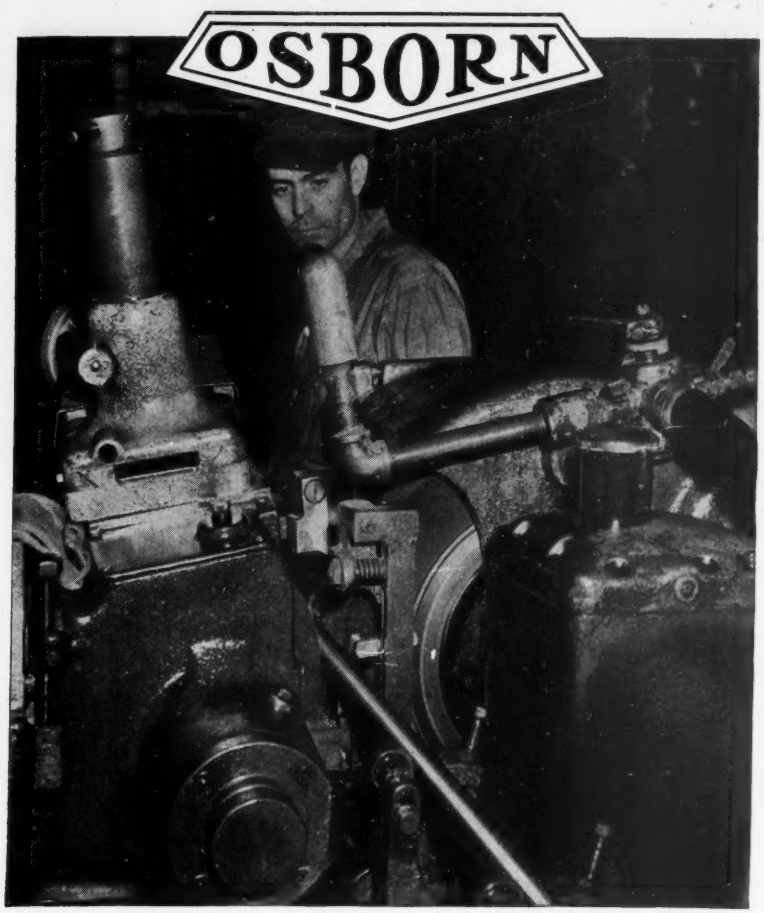
HEALD

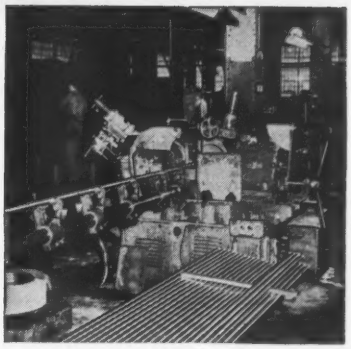
Heald machines speed the nation's production

THE HEALD MACHINE COMPANY

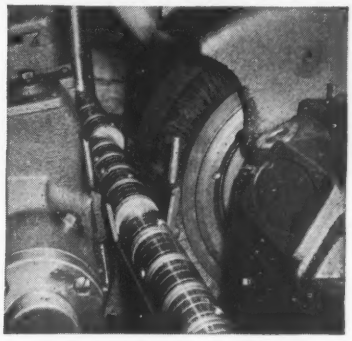
WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York





THE SET-UP. This shows the centerless grinding machine which also serves as a "centerless brusher". These pump rods vary from 1⅛ in. to 1½ in. diameter . . . from 6 ft. to 36 ft. in length. Regulating wheel speed is 52 r.p.m.



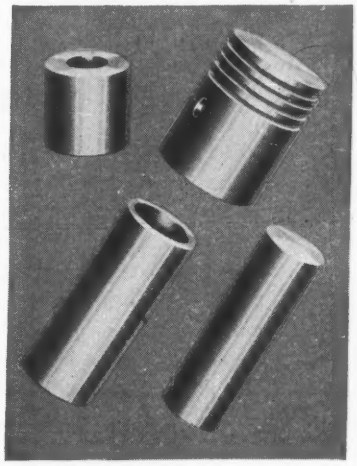
ANOTHER JOB. Here Centerless Brushing finishes cast iron pistons to microsmoothness. Simplifies assembly operations and increases life of pistons and cylinders. Output of this machine is 10,000 pieces per 8 hours.

Finer finish . . . longer product life with Centerless Brushing

This machine does double duty. For removal of metal to close tolerance, it is a *centerless grinder.* Then, for finishing the surface to microsmoothness it is a *centerless brusher.* Its conversion takes only a few minutes.

In the operation shown above, nickel-moly steel rods for pumps, are being finished by an Osborn Fascut Brush. Prior to brushing, the same machine with a grinding wheel in place of the brush made a rough grind, taking off .006 inch, and a finish grind, taking off .002 inch. Results of the Centerless Brushing: Produces a smoother finish. Reduces wear in pump packing. Reduces corrosive action on rods; makes them last longer.

An **O**sborn **B**rushing **A**nalyst helped develop this improvement. Ask your **OBA** to help *you* on all problems of cleaning and finishing! Call him today or write *The Osborn Manufacturing Company, Dept. 731, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



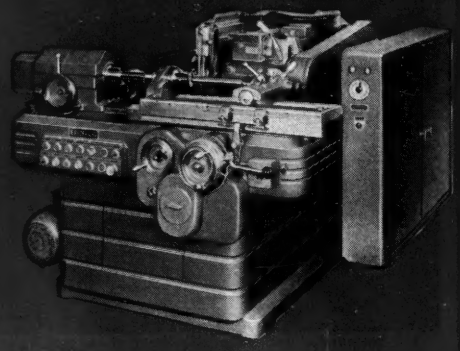
TYPICAL PARTS which are being improved by Centerless Brushing include pistons, piston pins, bushings, tubing . . . any cylindrical parts. It can be applied to many sizes of parts and types of material on a mass production basis.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

Ex-Cell-O Style 33 Precision Thread and Form Grinder

Ex-Cell-O Thread Grinders



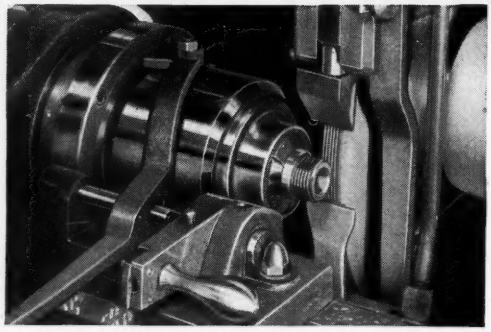
Ex-Cell-O Style 33 Automatic Precision Thread Grinder

ARE IN DEFENSE WORK

GRIND THREADS ON PARTS FOR PLANES, GUNS, ROCKETS

Ex-Cell-O Precision Thread Grinders are in the thick of the defense program. They're used for grinding threads on parts for both jet and reciprocating aircraft engines and many items of armament. For accurate threads on hardened steel parts the threads must be ground after hardening. For alloys and stainless steels that are tough, though not extremely hard, thread grinding is often more economical than other methods.

Internal, external, and universal thread grinders are included in Ex-Cell-O's complete line. If you are considering thread grinding write or phone to Ex-Cell-O in Detroit for more information and complete specifications. Better yet—call in your local Ex-Cell-O representative and show him the job. He's qualified to help you.



Threading gun barrels on a Style 33 Thread Grinder with multiple rib wheel.

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 130 No. 26 June 30, 1952

√NEWS √PRODUCTION-ENGINEERING √MARKETS

SPECIAL REPORT: Annual Midyear Review and Forecast, Page 51

Metalworking Outlook 35

As the Editor Views the News 39

Windows of Washington 56
Washington Editor E. C. Kreutzberg relates the Washington scene to its effect on metalworking

Mirrors of Motordom 61

The Business Trend 65
Facts and figures on segments of metalworking . . . Steel's Industrial Production Index . . . Barometers of Business

Men of Industry 69

Production-Engineering News at a Glance 75

Titanium Production Developments 76
Expected output this year will be about 5000 tons, nearly three times the 1951 figure

Adding Machine Parts Handled Faster by Compressed Air .. 80
Air-operated equipment spells the difference between tedious hand-production and streamlined manufacturing

Lubricants Smooth Die Casting Worries 82
Die problems faced by die casters can be minimized by use of the right lubricant.

Progress in Steelmaking 90
Instrumentation of open-hearth shop and finishing mill gives metallurgical control where it's needed most

New Products and Equipment 103

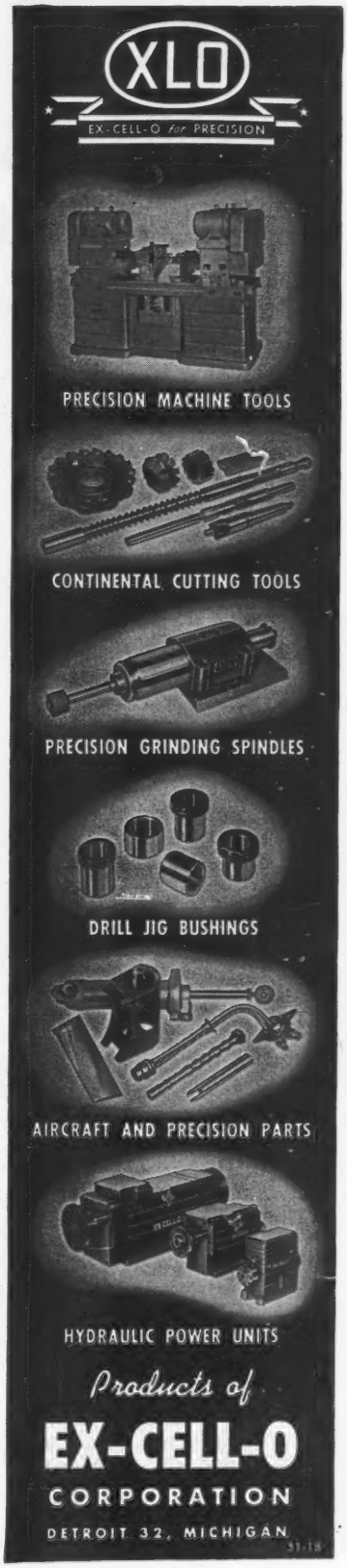
The Market Outlook 117
Metal Prices and Composites start on Page 118

The Metal Market 129

Behind the Scenes	6	Obituaries	72
Letters to the Editors	12	Calendar of Meetings	99
Subcontract Summary	55	Helpful Literature	113
Checklist on Controls	55	Here, There in Industry	139

Editorial, Business Staffs—10. Advertising Index—145. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.



CLEAR UP YOUR Grinding Jobs with the Right PELRON GRINDING COMPOUND

PELRON GRINDING COMPOUNDS, water soluble, produce a clear solution that not only prevents loading the finest grit wheel, but facilitates the work by enabling the operator to see the piece at all times.

PELRON GRINDING COMPOUNDS provide all the other desirable features of a grinding compound: excellent detergent properties, rapid settling of chips and grind particles, high rust preventive quality, stable in emulsion, neutral to the skin.

PELRON TECHNICAL SERVICES include, free, expert advice on facilitating many metal-working operations, through the use of PELRON special chemicals for industry: cutting oils, grinding, drawing and forging compounds, metal cleaners, rust preventives, etc., etc., etc.

Write us regarding your special problems. We're always "looking for trouble" — with the object of licking it, reducing *your* worries, increasing *our* experience.

Get in touch with our nearest office.

PELRON

CORPORATION

7740 W. 47TH STREET
LYONS, ILLINOIS

Chicago • Detroit • South Bend • Cleveland
Milwaukee • Indianapolis • Rock Island • Buffalo

Behind the Scenes...

Reprints

Reprints of the "Guide for Selecting Tool Steels and Carbides," which appeared in the June 16 issue, are available for distribution. We'll be glad to send you a single copy gratis. Larger orders will be filled at nominal cost. Contact Readers' Service Department, STEEL, Penton Bldg., Cleveland 13, O.

Hot Spots

We were sitting here the other day mopping our brow and muttering about the 90° to 100° heat. It occurred to us that it couldn't possibly get much hotter than it was that day.

We did a little checking, however, and found that the hottest temperature ever recorded in the U. S. was a blistering 134° at Death Valley in 1913. Hottest for the world came in 1922 in Libya, North Africa. The temperature that day was 136°.

After our researches, we felt a little better.

Speed of Smoke

Maj. Gen. C. S. Irvine, deputy for production of the Air Force Materiel Command, measures air speed by smoke, not by any new-fangled technical device.

The inveterate cigar smoker, who piloted B29s in World War II and now is at home at the throttle of the supersonic B36, sums up his personal computation this way: "Formerly one cigar took me 200 miles. Now I can get 600 miles out of the same cigar."

Relief

Controls are really riding for a fall. You don't have to charge ceiling prices now, according to an OPS ruling, if you're selling a car 20 years or older or if it's an orphan auto like Cord, Hupmobile, Dusenberg and Reo.

At last! We can market our 1927 Chandler.

What's Ahead?

To the east of here in a special four-page insert is STEEL's regular "Mid-year Review & Forecast." About ten editors and two artists combined their talents to put this one together. It's designed to bring you up to date on how the major economic trends in the past six months have acted and how they are expected to operate in the next half.

The editors got the consensus among metalworking executives, economists and bankers to work up the article.

He Gets Around

The other day we received the May copy of *The U. S. Steel Quarterly*, a publication detailing developments in U. S. Steel Corp. and subsidiaries. A cut on p. 10 looked vaguely familiar. Sure enough, it showed our Eastern Editor Ben Price, along with other reporters, at a news conference held by J. Carlisle MacDonald, assistant to the chairman of U. S. Steel, regarding a quarterly report of earnings.

Puzzle Corner

The answers poured in for our pole problem of June 16. The total height was 72 feet, as reported by Richard Cutler of Powdered Metal Products Corp., S. S. Maremont of Maremont Automotive Products Inc., William Albert of Park Forge Co., Peter L. Loewe of Triad Engineering Corp., R. R. Rychener of National Gypsum Co., Ralph Pappenheimer of Specialty Device Co., H. B. Shapleigh of Bethlehem Steel Co., and T. S. Bean of Barber & Ross Co.

Three farmers—Reginald, Percival and Joe—went to the market with their wives—Monica, Mame and Genevieve—to buy hogs. Each paid as many dollars per hog as the number of hogs he or she bought. Each man spent $63 more than his wife. Monica bought 19 more hogs than Reginald, and Joe bought 23 more than Genevieve. Who is married to whom?

Shradu

(Metalworking Outlook—Page 35)

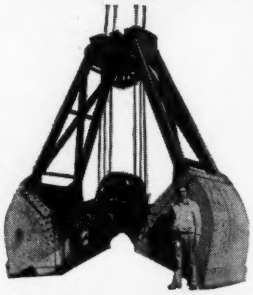
Wellman will build it

Special Cranes
Ore Bridges
Gas Producer Plants
Charging Machines
Forging Manipulators
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman ore and coal handling bridges

give fast and efficient operation

One of two 6-ton Coal Handling Bridges in this installation.



6-ton Wellman Williams Type Coal Bucket used with these bridges.

● Take advantage of Wellman's long experience in designing and building handling bridges of many types and capacities. Your selection from the complete line will provide fast and efficient handling of coal or ore. Wellman equipment, in service the world over, is recognized for its long life and dependable service. It is backed by more than half a century of engineering experience.

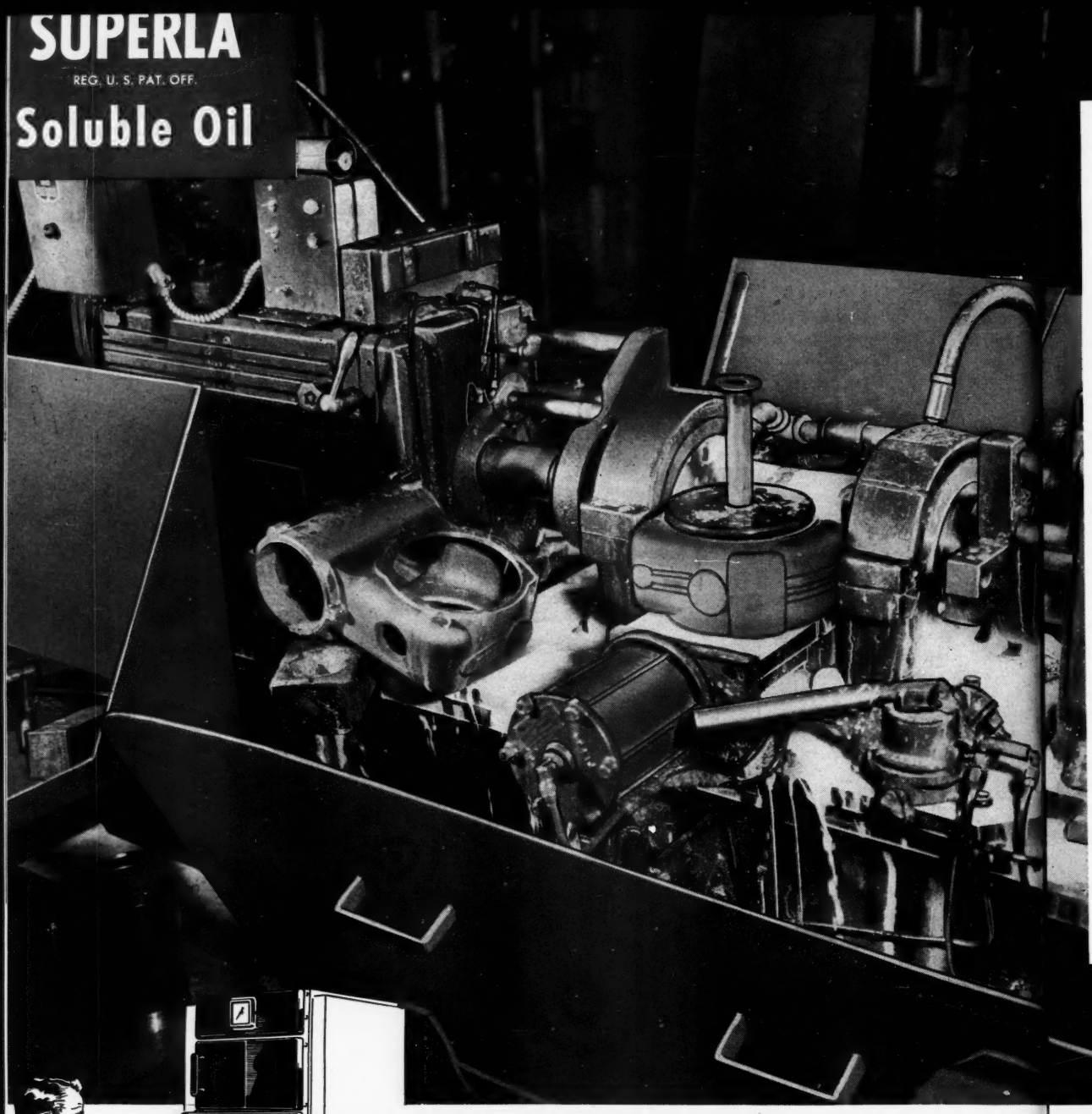
THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

SUPERLA

REG. U. S. PAT. OFF.

Soluble Oil



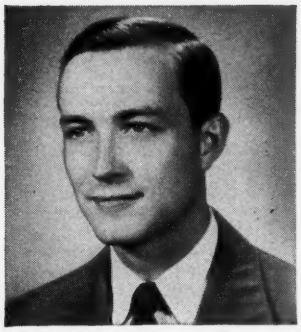
Solution for a hard water problem

"With the hard water we have at this plant, SUPERLA Soluble Oil works best of all products tried," reports Carl J. Winkler, president of U. S. Machine Corporation, Lebanon, Indiana. The company, manufacturing Winkler heating equipment, has used SUPERLA for 15 years. During this period, other coolants have been tried, but none has given the results obtained with SUPERLA Soluble Oil.

Boring of the cast iron main housing for a Winkler oil burner is illustrated above. With SUPERLA Soluble Oil, the life of carbide tools has proved excellent. There has been no spoilage of the work due to rusting. Moreover, clean operation and freedom from odor development with SUPERLA have provided desirable working conditions for machine operators.

To help select the right coolant or cutting oil for your own machine tool operations, call for the services of a Standard Oil lubrication specialist. Contact your nearby Standard Oil Company office.

What's YOUR problem?



Meet Wesley L. Tharp, lubrication specialist with headquarters at Standard Oil's Indianapolis office. U. S. Machine Corporation is one of the manufacturing companies he contacts regularly in order to help keep production running smoothly.

Like all Standard Oil lubrication specialists, Wesley Tharp has a good background of experience plus thorough training in Standard's own schools. And like all specialists, his on-the-job assistance is always available to the industries in the area he serves. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest.

Put a Standard Oil lubrication specialist to work on your problem.

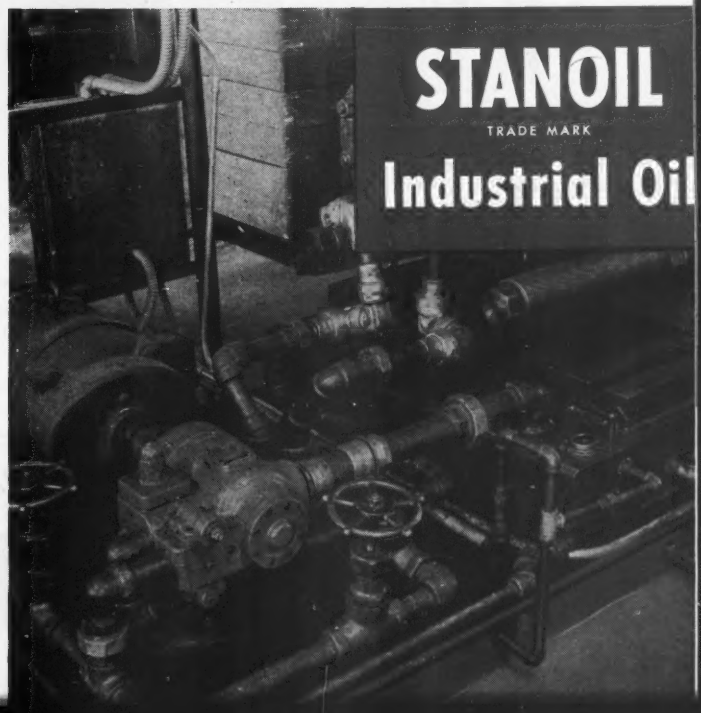
STANDARD

STANDARD OIL COMPANY
(INDIANA)

PUT MORE PUNCH INTO PRODUCTION with STANOSTAMP Compounds. Consider the case of this manufacturer of automotive components who boosted production from 10,000 piece parts to as many as 100,000 before dies required polishing. This was the result of switching from an oil base compound to STANOSTAMP Compound "C".

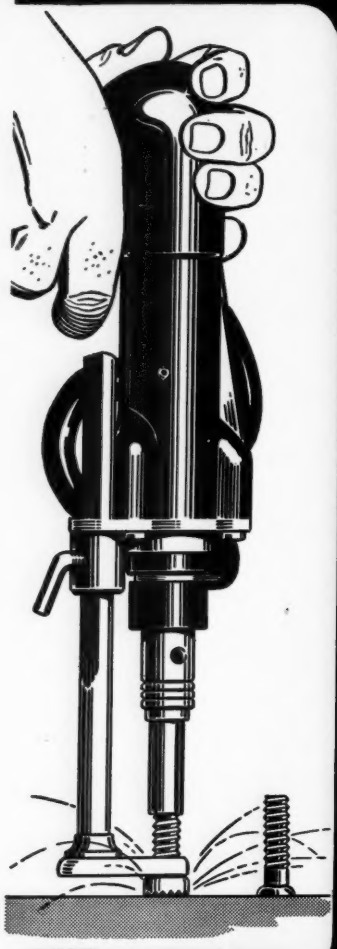
For maximum protection for both dies and work in your own pressroom, ask your Standard Oil lubrication specialist about STANOSTAMP. Three grades are available to cover a wide range of stamping and heavy drawing work on low carbon or alloy steel.

FIVE YEARS, NO CHANGE OF OIL. That's the record to date for the STANOIL Industrial Oil serving the hydraulic unit shown below. After five years of service the oil is in near-perfect condition. There is no deposit and no varnish in the hydraulic system. There has been no need to clean the system. For comparable trouble-free performance in your own hydraulic units, or for lubrication of speed reducers, head stock gears, auxiliary turbines, and compressors, call your local Standard Oil office. Or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.



IN STEEL FABRICATION...

HERE'S HOW NELWELD SPEEDS PRODUCTION



AN ELECTRIC ARC WELDING PROCESS

END-WELDS STUDS TO STEEL IN A SPLIT-SECOND

ELIMINATES DRILLING, TAPPING, HAND WELDING

REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK

NELWELD

SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES

IMPROVES PRODUCT DESIGN AND QUALITY

A NELWELD CLINIC CAN SHOW YOU—

right in your own plant, how you can benefit from this modern fastening method.

Write today for the Nelweld Clinic brochure to Lorain, Ohio.

Fasten it Better... at Less Cost, with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

STEEL

EDITORIAL STAFF

Editor-in-Chief ..... E. L. SHANER
Editor ..... IRWIN H. SUCH
Managing Editor ..... WALTER J. CAMPBELL
Market Editor ..... WM. M. ROONEY
Engineering Editor ..... WALTER TOERGE
Steel Plant Editor ..... J. D. KNOX
Consulting Editor ..... ALLEN G. GRAY
Art Editor ..... DON S. CADOT

Associate Editors:

FRANK R. BRIGGS, JAY DEEULIS
VANCE BELL, JOHN S. MORGAN
EDWARD C. BIRKNER

Assistant Editors:

WILLIAM R. WOLFE
DOLORES K. MAILLE, M. T. BORGERHOFF
ARTHUR W. ZIMMERMAN, ROBERT E. HALL
JOHN KELSEY, ROBERT O. JAYNES
ROBERT F. HUBER, FLOYD G. LAWRENCE
L. J. SKUDERIN

Resident Editors:

Washington ..... E. C. KREUTZBERG
New York ..... B. K. PRICE, L. E. BROWNE
SAMUEL W. BAKER
Pittsburgh ..... EDWIN L. KARPICK
Detroit ..... H. C. TUTTLE
Chicago ..... E. F. ROSS
London, European Editor ..... VINCENT DELPORT

Editorial Correspondents:

Birmingham, R. W. Kincey; Buffalo, L. G. Feldmann; St. Louis, Mac L. Hutchens; Youngstown, George R. Reiss; Los Angeles, Norman Lynn; San Francisco, Edwin Haverty; Seattle, R. C. Hill; Dallas, C. K. Cates; Toronto, F. S. Tobin; Birmingham, Eng., J. A. Horton; Paris, France, Leon Jaudoin; Liege, Belgium, Jacques Foulon; Dusseldorf, Germany, Herbert Gross.

BUSINESS STAFF

Business Manager ..... J. W. ZUBER

Advertising:

Service Manager ..... C. H. BAILEY
Production Manager ..... A. V. ANDERSON
New York ..... E. W. KREUTZBERG, K. A. ZOLLNER
CALVIN FISHER JR.
Pittsburgh ..... S. H. JASPER, H. G. ROWLAND
J. C. SULLIVAN, T. R. WARREN
Chicago ..... L. C. PELOTT, W. L. POLAND
Cleveland ..... D. C. KIEFER, H. G. ROWLAND
C. A. TALLINGER, E. L. FRANKE
Los Angeles ..... F. J. FULLER
Griffin, Georgia ..... FRED J. ALLEN

Market Research and Promotion:

Promotion, Research Mgr. ..... S. F. MARINO
Market Statistics ..... GEO. J. AUNER
Mail & List Service ..... BETTY HINTON

Circulation Department:

Manager ..... G. R. EBERSOLE
Field Represent. ..... H. R. DUNNE, C. A. PRICE

Main Office:

Penton Building, Cleveland 13, Ohio
Main 1-8260

Branch Offices:

New York 17 ..... 60 East 42nd St.
Murray Hill 2-2581
Chicago 11 ..... 520 North Michigan Ave.
Whitehall 4-1234
Pittsburgh 19 ..... 2837 Koppers Bldg.
Atlantic 1-3211
Detroit 2 ..... 6560 Cass Ave.
Trinity 5-3024
Washington 4 ..... 1123 National Press Bldg.
Executive 6849
Los Angeles 48 ..... 6262 Commodore Sloat Dr.
Webster 1-6865
Griffin, Georgia ..... 331 South 12th St.
Griffin 7854
London, 2 Caxton St., Westminster, S.W. 1

Published by

THE PENTON PUBLISHING COMPANY

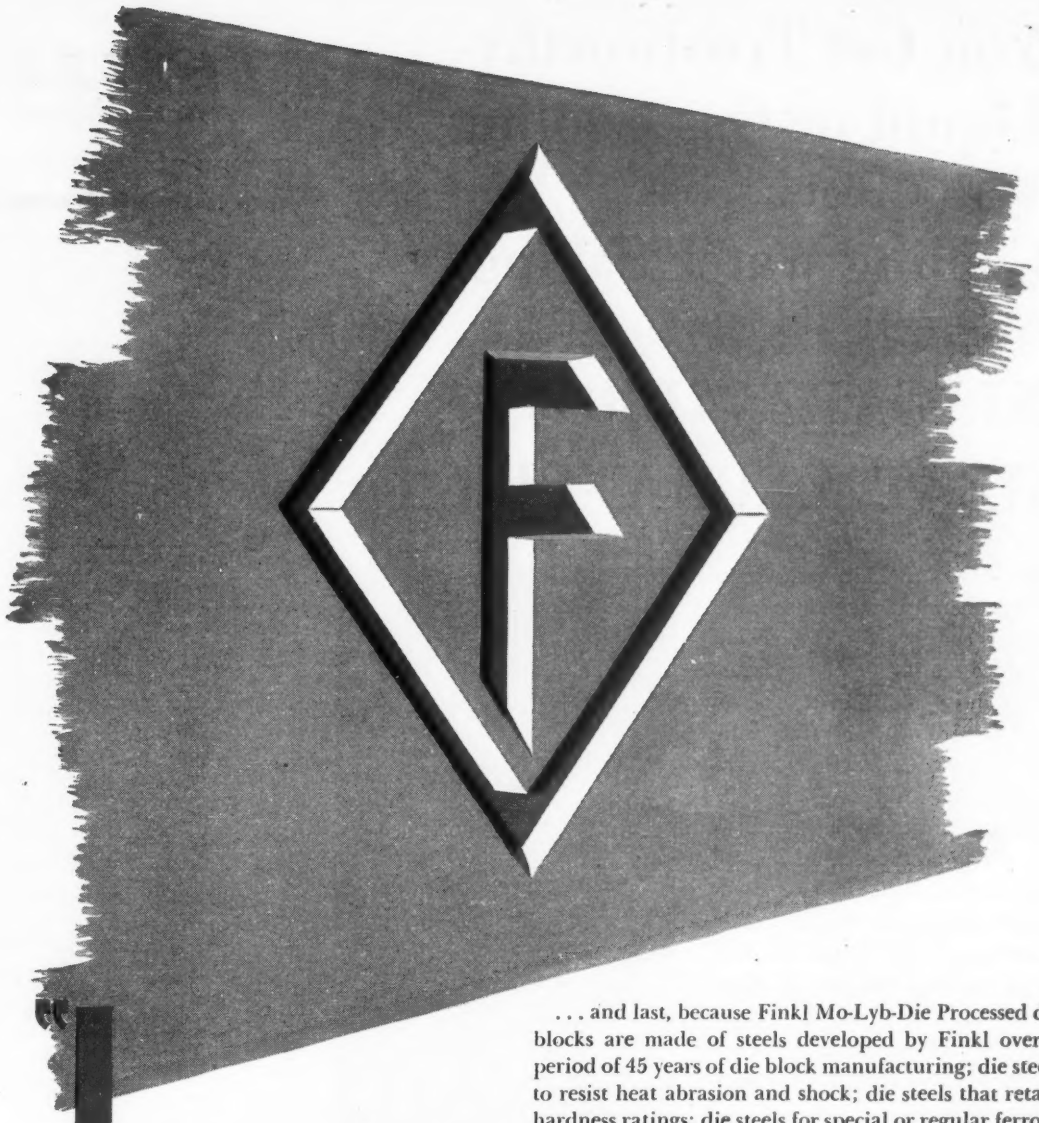
President and Treasurer ..... G. O. HAYS
Chairman ..... E. L. SHANER
Vice Pres., Director of Adv. ..... R. C. JAENKE
Vice Pres. and Secretary ..... F. G. STEINEBACH
Assistant Treasurer ..... R. W. COLEMAN

Also publisher of

FOUNDRY • MACHINE DESIGN
NEW EQUIPMENT DIGEST

CCA NBP

Member, Controlled Circulation Audit Inc., National Association of Magazine Publishers, Society of Business Magazine Editors, and National Business Publications Inc.



Impressions that LAST"

. . . and last, because Finkl Mo-Lyb-Die Processed die blocks are made of steels developed by Finkl over a period of 45 years of die block manufacturing; die steels to resist heat abrasion and shock; die steels that retain hardness ratings; die steels for special or regular ferrous and non-ferrous applications; in fact, die steels for virtually any need that arises. And all of them will give you more forgings per impression and more impressions per die.

Since 1879 Finkl has produced quality products. This overall experience may be useful to you when you are planning new dies. It is available to you by calling or writing any of the offices listed below.

A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14

Eastern Warehouse: INDUSTRIAL STEEL, INC. 250 Bent St. Cambridge 41, Mass.
Western Warehouse: FINKL STEEL PRODUCTS OF CALIF. 4908 Santa Monica Blvd., Los Angeles 27, Calif.

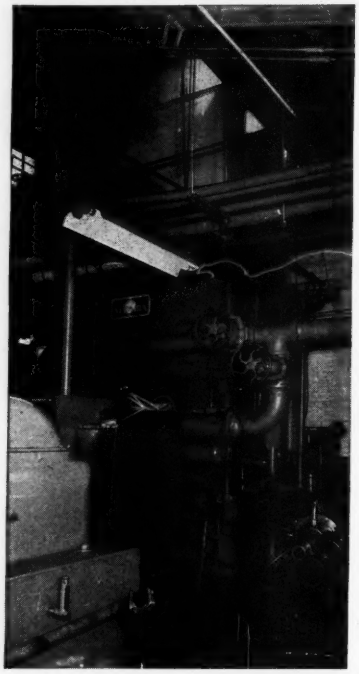
Detroit, Mich. • Cleveland, Ohio • St. Paul, Minn. • Houston, Texas • Birmingham, Ala. • San Francisco, Calif. • Colorado Springs, Col.

You Get Trustworthy Liquid or Gas Cooling With Great Cooling Water Savings from the NIAGARA AERO HEAT EXCHANGER

● You can cool air, gas, water, oils, chemicals, electric and power and process equipment, engines, mechanical processes with lower cost and really accurate control of temperature with the Niagara Aero Heat Exchanger.

You are assured of uniform, constant production and quality from any process . . . steady, reliable operation . . . lower cost for more dependable cooling. You can have closed system cooling with freedom from scale, dirt, corrosion and maintenance troubles. You can accurately cool more than one type of liquid with one machine.

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling. You can remove heat at the rate of input to keep accurate control of gas or liquid temperature. You can put heat back into the system to save the losses of a "warm-up" period or to equalize the effect of load variations.



Great savings in cooling water and savings in piping, pumping and power return the cost to you quickly. The Niagara Aero Heat Exchanger can save you approximately 95% of your cooling water cost. Write for Bulletin 120.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities of U. S. and Canada

LETTERS
TO THE EDITORS

Help in Selecting Tool Steels

Thanks for the great deal of work you must have spent in preparing your "Tool Steel Guide". The June 16 issue of STEEL is going to be our reference file on the subject.

J. J. Adams
Hubbard Roof Bolt Co.
Huntington, W. Va.

We would appreciate receiving four copies of your 32-page special report "Guide for Selecting Tool Steels & Carbides," (June 16).

D. A. Friedman, vice president
Hanover Division
Solar Steel Corp.
Union, N. J.

Will you kindly forward a copy of your Tool Steel Guide . . .

Lloyd Reeder Jr.
K. B. Butler & Associates
Mendota, Ill.

Kindly send us two copies . . .

W. Gutmann
Ideal Fastener Corp.
Long Beach, L. I., N. Y.

I understand that you publish a "Directory of Tool Steels." I would like to know if it is still in print so we may order some copies.

Morris T. Roberts
chief metallurgist
Harnischfeger Corp.
Milwaukee

● *This special report is available in reprints from our Readers' Service.*

'Well Done' for Defense Pools

I think your article "Defense Pools: Far From Overflowing" (June 2, p. 68) is well done.

A. J. Lubin
Small Defense Plant Administration
Washington

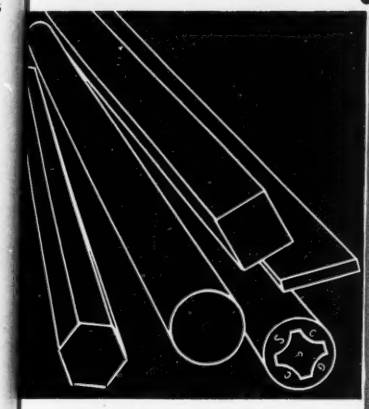
Who and Where Department

Would you please tell us whom to contact for more information about the tests discussed in your article "The Truth About Fretting—Corrosion Problem Really Physical Change" (May 19, p. 103)?

E. F. Lewellen
Lewellen Mfg. Co.
Columbus, Ind.

● *Contact Douglas Godfrey, National Advisory Committee for Aeronautics, Cleveland.*

Cold Finished Steel Bars Immediately Available...



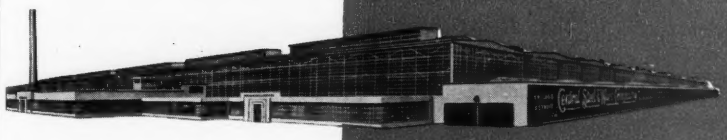
at CENTRAL STEEL AND WIRE COMPANY

Rounds, Squares, Hexagons, Flats, Ground Shafting.

Small sizes, in Bessemer and Openhearth analysis, are now fairly complete.

Central Steel and Wire Company has always maintained one of the most widely diversified stocks of Carbon, Alloy and Stainless Bars available anywhere.

The next time you need materials, call the Central Steel Warehouse nearest your plant or job, we will welcome an opportunity to serve you.



Hot Rolled • Cold Finished
Carbon & Alloy • Stainless
Copper • Brass • Aluminum
Expanded Metal • Structurals

Central Steel & Wire Company

CHICAGO 80, ILL.
P. O. Box 5310-A
REpublic 7-3000

DETROIT 12, MICH.
13400 Mt. Elliott Ave.
TWinbrook 2-3200

CINCINNATI 14, OHIO
Box 148 Annex Sta.
AVon 2230

MILWAUKEE 14, WIS.
6623 W. Mitchell St.
EVergreen 4-7400

Gold Depository in Fort Knox, Kentucky

. . . more important than gold!

The most important metal today is not the tons of gold buried at Ft. Knox!

Far more important are the millions of tons of iron and steel scrap so desperately needed to make new steel. All scrap, actual and potential, needs to be gathered up and channeled to the steel producing plants-NOW, today, tomorrow and tomorrow. So long as the steel industry is called upon to produce two million and more tons of ingot steel per week, it must have one million and more tons of scrap each week.

Steel producers are getting the iron ore, limestone and coal they need. But the scrap situation is critical and will continue to be so until inventories are built up substantially.

As a user of steel--as one interested in seeing that America's rearmament program is not too little and too late--you can do your part to see that your community and your business keep scrap moving toward the mills.

YOUR SCRAP V YOUNGSTOWN IS NEEDED

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

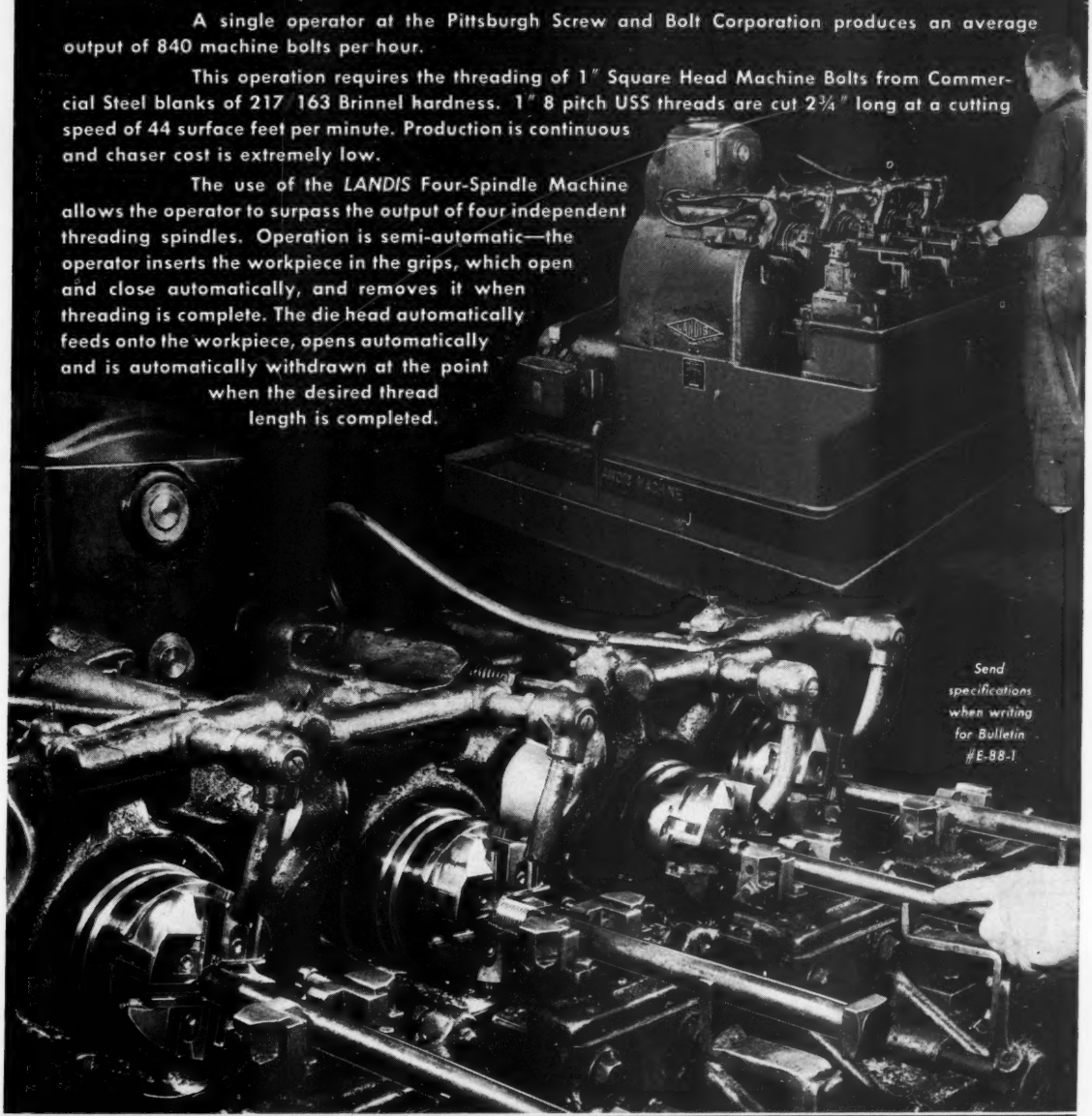
The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

One Machine Bolt Threaded Every 4⅓ Seconds... WITH THE *LANDIS* 4-SPINDLE SEMI-AUTOMATIC THREADER

A single operator at the Pittsburgh Screw and Bolt Corporation produces an average output of 840 machine bolts per hour.

This operation requires the threading of 1" Square Head Machine Bolts from Commercial Steel blanks of 217 163 Brinnel hardness. 1" 8 pitch USS threads are cut 2¾" long at a cutting speed of 44 surface feet per minute. Production is continuous and chaser cost is extremely low.

The use of the *LANDIS* Four-Spindle Machine allows the operator to surpass the output of four independent threading spindles. Operation is semi-automatic—the operator inserts the workpiece in the grips, which open and close automatically, and removes it when threading is complete. The die head automatically feeds onto the workpiece, opens automatically and is automatically withdrawn at the point when the desired thread length is completed.



Send specifications when writing for Bulletin #E-88-1

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

You certainly don't *want* to let quality slip in favor of volume, but there's always the chance of it happening whenever the emphasis is laid on maximum output.

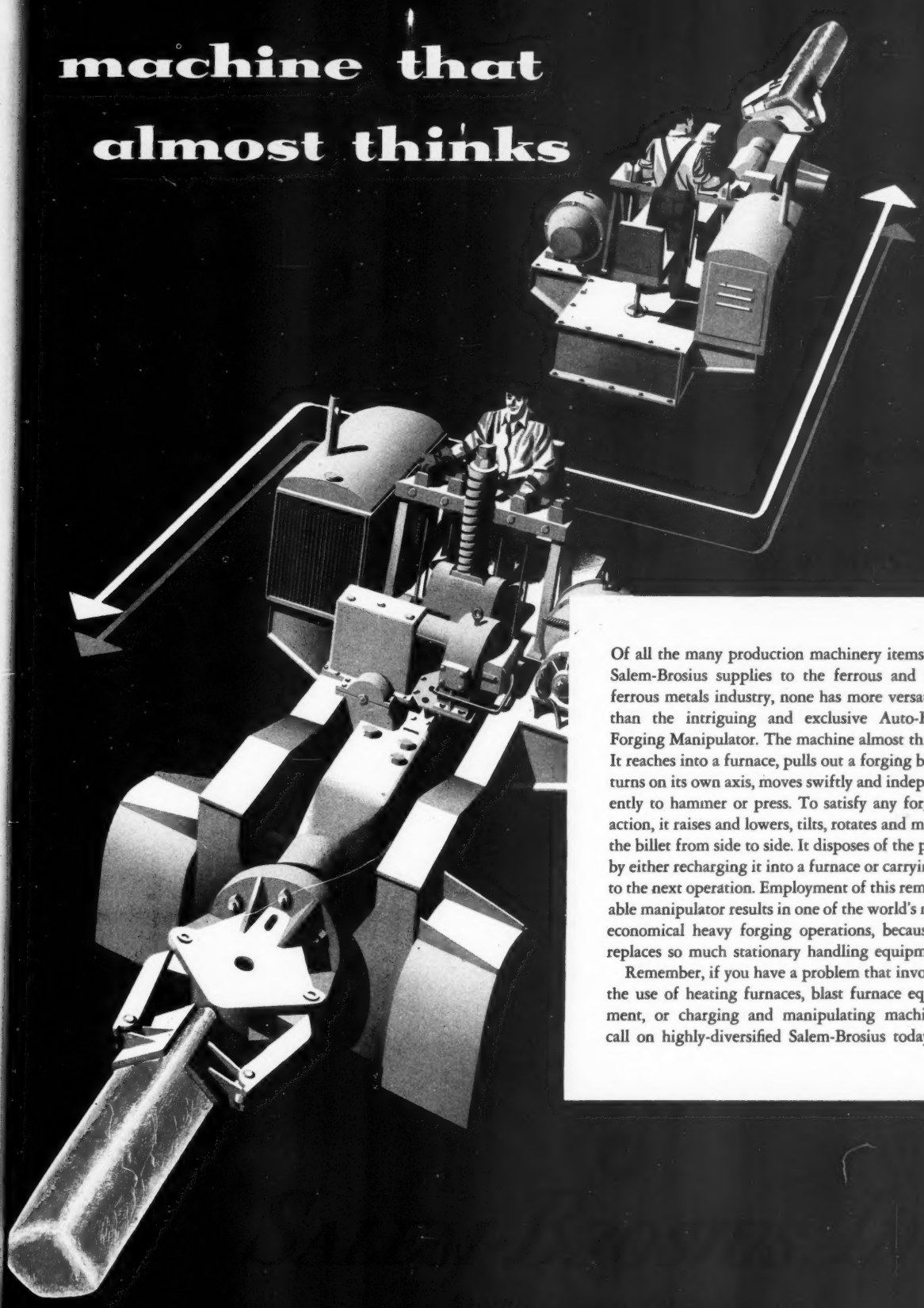
That's when the long-standing Columbia tradition of craftsmanship pays off extra for users of our products. It's a nice bit of insurance to know how completely you can rely on the constant uniformity of Columbia cold-finished steel bars and Summerill cold-drawn seamless steel tubing . . . just when you need it most.

WAD 4091

Columbia STEEL & SHAFTING COMPANY
SUMMERILL TUBING COMPANY DIVISION
Pittsburgh 30, Pennsylvania

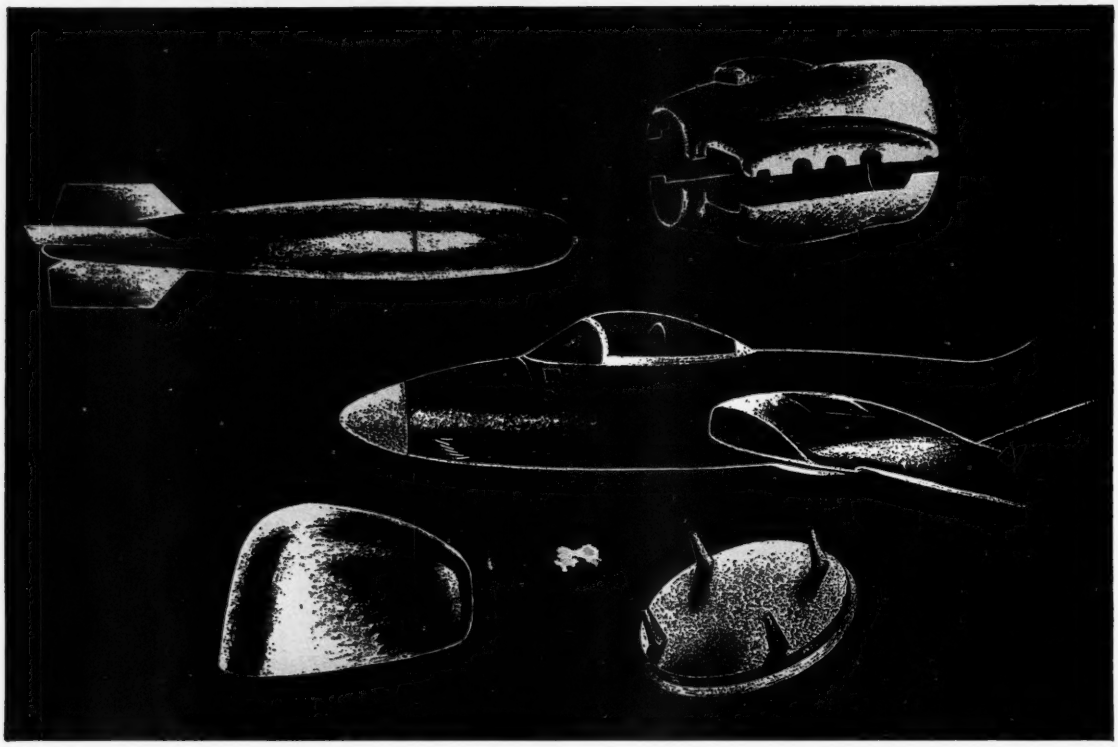
SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING

machine that almost thinks



Of all the many production machinery items that Salem-Brosius supplies to the ferrous and non-ferrous metals industry, none has more versatility than the intriguing and exclusive Auto-Floor Forging Manipulator. The machine almost thinks. It reaches into a furnace, pulls out a forging billet, turns on its own axis, moves swiftly and independently to hammer or press. To satisfy any forging action, it raises and lowers, tilts, rotates and moves the billet from side to side. It disposes of the piece by either recharging it into a furnace or carrying it to the next operation. Employment of this remarkable manipulator results in one of the world's most economical heavy forging operations, because it replaces so much stationary handling equipment.

Remember, if you have a problem that involves the use of heating furnaces, blast furnace equipment, or charging and manipulating machines, call on highly-diversified Salem-Brosius today.



A SIGNIFICANT ADVANCE IN AIRCRAFT ENGINEERING...

POLYESTER REINFORCED PLASTICS—

Aircraft designers have found a new way to improve performance and reduce weight in many components formerly made of metal, thereby releasing metals for jobs only metals can do. They're specifying reinforced plastics made of glass fiber cloth or mat, bonded with BAKELITE Polyester Resins.

These new plastics have been employed for a variety of aircraft and marine applications, where a combination of great strength and low weight is necessary, and ease of fabrication is important. Fin tips, radomes, air intakes, flooring, and duct work are on the growing list of their applications.

Several different BAKELITE Polyester Resins, as well as grades of glass fiber cloth, are available to meet widely varying needs. For example, one type of reinforced plastic is produced from Owens-Corning "Fiberglas" cloth 181-136, laminated with BAKELITE Polyester Resin BRSQ-193, plus 10% monomeric styrene. The resulting laminate, when tested at standard conditions under U. S. Air Force Specification No. 12049, provides these physical properties:

Ultimate Strength, Flexural, Flatwise ..... 63,400 psi
Ultimate Strength, Tensile. 47,400 psi
Ultimate Strength, Compressive, Edgewise. 39,700 psi
Impact Strength, Edgewise, Notched Izod, in. notch. 20.53 ft. lb.

All of these values greatly exceed the requirements of the specification. Yet, the specific gravity of this reinforced plastic, which contains about 36 to 38 per cent resin, is only 1.8.

Reinforced plastics made with BAKELITE Polyester Resins have excellent electrical characteristics, including electrical "transparency" for radar housings. They are all within the Air Force flammability requirements. They are also highly resistant to such chemicals as hydraulic oil, isopropanol, ethylene glycol, and fluid hydrocarbon, Type II. Details on these and other valuable properties of reinforced plastics are included in booklet H-16, "BAKELITE Polyester Resins for Reinforced Plastics." Write Dept EC-49.

BAKELITE
TRADE-MARK
POLYESTER RESINS

TRADE MARK

BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
30 East 42 Street, New York 17, N. Y.
In Canada:
Bakelite Company (Canada) Ltd., Belleville, Ont.

it doesn't look like a turret lathe, BUT...

- It sets up *fast*—like a turret lathe.
- It uses turret lathe tools.
- It machines turret lathe lots, on an automatic basis, without the usual penalties of automatic operation.
- It will combine certain operations not possible in accepted turret lathe practice, thus reducing machining time.
- It will automatically change speeds and feeds under cut to assure more efficient performance of your cutting tools.
- It requires less skill to operate—and one man can handle two or more machines.

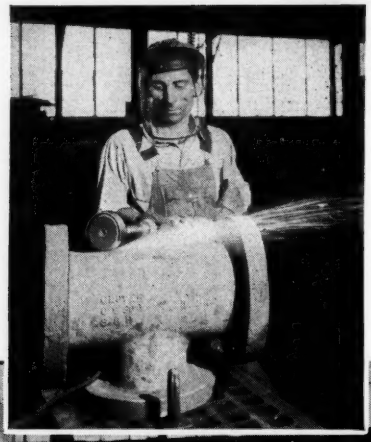
. . . it is the Warner & Swasey 1-AC Single Spindle Automatic Chucking Machine.

With today's emphasis on greater production, there are undoubtedly certain jobs in your shop that could be machined faster and better on the 1-AC. Call in your nearest Warner & Swasey Field Engineer—he'll show you exactly how it can improve your operation.

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

Why U. S. Rubber grinding wheels are the choice of steel foundrymen!



Small photo at top shows worker grinding large "T" used in refineries. Large photo shows worker smoothing casting of elbow.

A foundry in Georgia, casting steel pipe fittings, removes gates and flash, grinds openings and bolt holes—using U.S. Royalite® Grinding Wheels exclusively. Why? Because they have proven to be the most efficient and economical. They are fast-cutting and remain cool in operation.

Over 89 years of experience with bonds and abrasives enable United States Rubber Company to lick most any grinding wheel problem you may have. Write to address below.

GRINDING WHEEL INSTITUTE MEMBER

PRODUCTS OF

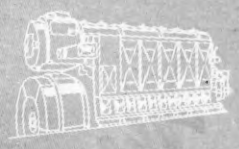
U.S.RUBBER

SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Put Your Power Costs and Performance in Order



1 ***Handle Peak Demand*** **...reduce peak demand values for lower purchased power rates.**

2 ***Power Factor*** **. . . in-plant power generator can eliminate power factor penalties.**

3 ***Emergency Power*** **. . . insurance against lost production and damage resulting from line failures.**

4 ***Handle Surge Loads*** **. . . that may now be affecting current characteristics of entire plant.**

5 ***Plant Expansion*** **. . . need not be restricted due to lack—or expense—of ample power.**

6 ***Useful Heat*** **. . . lube oil, water and exhaust heat can be turned from waste to profit.**

7 ***Chemical Value*** **. . . exhaust gases are high in free nitrogen—available for economical fixation of nitrates, ammonia, etc.**

8 ***Insurance Advantage*** **. . . of diesel over gasoline engine, for example, will soon pay for installation.**

9 ***No Weather Worries*** **. . . ice, snow, sleet, wind storms can't stop plant operations.**

10 ***Handle Increasing Load*** **. . . in-plant power economically adds to current capacity as loads increase.**

11 ***Fuel Economy*** **. . . use diesel oil, natural gas or sewage gas for added economy.**

12 ***Remote Locations*** **. . . distance from transmission lines needn't curtail plant expansion.**

13 ***More Compact Power*** **. . . Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.**

14 ***Minimum Attendance*** **. . . Fairbanks-Morse in-plant generating sets require far less supervision or maintenance.**

15 ***Save Cost*** **. . . of running in new line where present transformers and power lines are already loaded.**

FAIRBANKS-MORSE DIESELS CAN BE YOUR

Power Keys

Here are the keys that have opened the way to adequate, reliable power for many plants — small and large. They have eliminated the penalty paid due to poor power factor, surge loads and adverse current characteristics.

But, Will They Fit Your Problem?

Look at the list! Would compact in-plant power generation unlock your plans for plant expansion . . . eliminate the need of using purchased power at rates based on *high* peak demand values . . . add to current capacity? The answer is yes—and it can mean the difference between profit and loss in your plant.

If you are seeking the keys to your power problem, write us today, outlining your needs. Fairbanks-Morse engineering can give you a *proved* answer . . . based on over 50 years' experience in industrial and municipal power generation. Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • PUMPS • SCALES • RAIL CARS • MAGNETOS • FARM MACHINERY

The Skill of Craftsmanship

No longer are horseshoes hammered out by hand, or steel and wire made by crude methods; but even with the most modern machinery and scientific checks, Washburn wire still is made with that touch of craftsmanship which comes from long experience.

Special lots for unusual requirements are second nature at Washburn.

EAGLE Music Spring Wire

Round Untempered Low and High Carbon Spring Wires

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish

Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

The third eye of inspector Harford
Inspector Emma Harford's third eye is a "Comparator," a machine that magnifies Esterbrook Renew-Points to sixty-two times normal size. It checks point outline, and width of ink slit. Variations from standard are quickly spotted, rejected and scrapped.
Fountain Pen.
Searching inspections and constant attentions to quality details mean no "comebacks" from sales of Esterbrooks—and help to explain the ever-increasing popularity of this, the pen with "the right point for way YOU write."
Esterbrook
FOUNTAIN PEN
ESTERBROOK . . . America's Pen Name Since 1858

P.S.

Jones & Lamson Comparators guarantee swift, sure QUALITY CONTROL—*throughout your production lines.* Write for Catalog No. 402. One of our eleven models will fit your needs.

JONES & LAMSON

JONES & LAMSON MACHINE COMPANY
Springfield, Vermont, U. S. A.

Machine Tool Craftsmen Since 1835

COMPARATOR DIV.
Dept. 710

Jones & Lamson Machine Company
Springfield, Vt., U.S.A., Dept. 710
Please send Comparator Catalog No. 402.

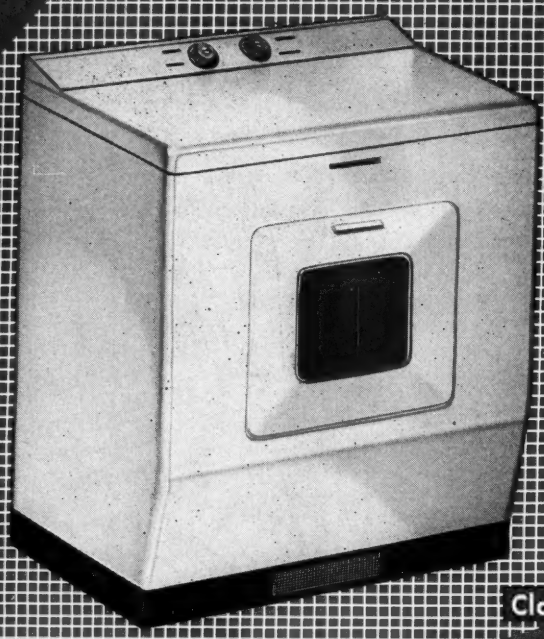
NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ STATE_____

clothes dryers to deep fryers



wire cloth

FOR HOME APPLIANCES

Whether the wire cloth is to be "standard" . . . or "strictly to specifications" . . . or a tough "start from scratch" new development problem—Reynolds engineers are right at home in the home appliance field. And in other fields—automobiles to aircraft . . . farm harvesters to fly swatters . . . floor furnaces to faucet filters. And for the same reasons—Reynolds' fifty years of fabricating wire, and many, many more years of research measured in engineering man-hours. If you use wire cloth, Reynolds engineers can be helpful. Consult them without cost or obligation.

- Clothes Dryers
- Automatic Washers
- Dishwashers
- Refrigerators
- Home Freezers
- Vacuum Cleaners
- Electric Ventilators
- Dehumidifiers
- Fruit Juicers
- Electric Deep Fryers

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO.
DIXON, ILLINOIS

Divisions of National-Standard Co.

ATHENIA STEEL...*Clifton, N. J.*.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...*Niles, Mich.*.....Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...*Jersey City, N. J.*.....Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*....Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES, MICHIGAN

What do you want in a drive

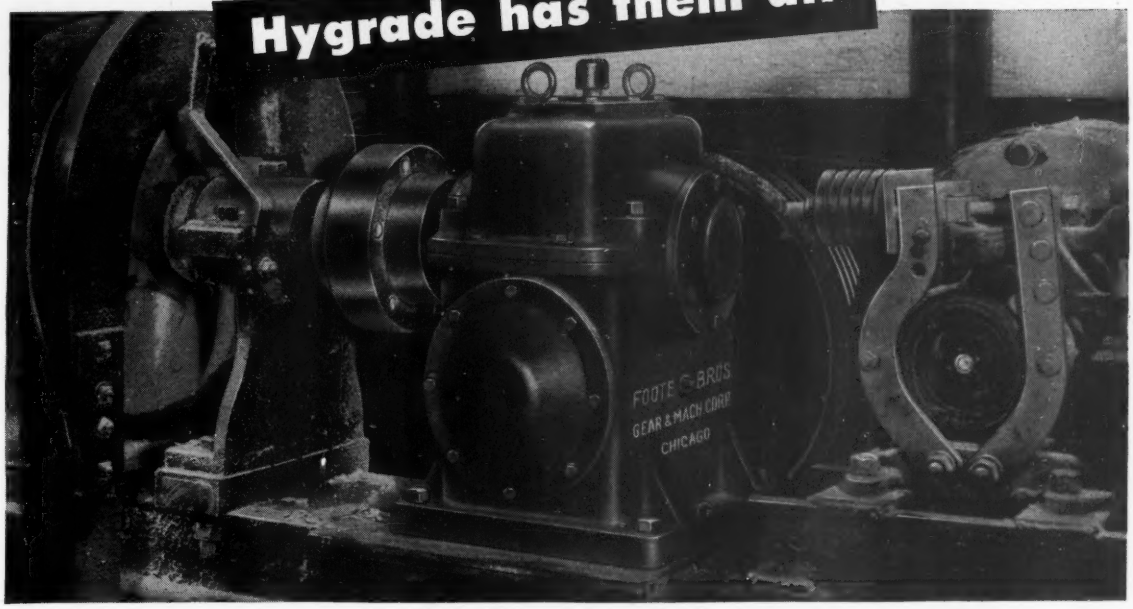
RUGGED STRENGTH

TROUBLE-FREE OPERATION

COMPACTNESS • ECONOMY

PRECISION ENGINEERING

Hygrade has them all



Engineered for those tough jobs in your plant where heavy duty demands rugged strength — ideal for any job where reliability, compactness, economy in operation are desired.

Foote Bros. Hygrade Drives are available in horizontal and vertical designs in a wide range of ratios up to 4108 to 1 — higher when required.

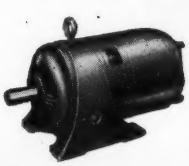
Hygrade Hytop Drives have wider, low-speed bearing span to accommodate long, unsupported vertical output shaft extensions, either upward, downward, or both. Advanced engineering, improved design, new techniques in manufacture, better control of material all make Foote Bros. Hygrade Drives ideal for your plant. Mail the coupon for Bulletin HGB.

FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Boulevard • Chicago 9, Illinois

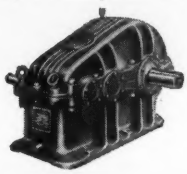
FOOTE BROS.

Better Power Transmission Through Better Gears

Line-O-Power Drives



Foote Bros.-Louis Allis Gearmotors



Maxi-Power Drives

FOOTE BROS. HYGRADE DRIVE
Installed on the manlift in International Milling Co. Plant at Detroit, Michigan.

Foote Bros. Gear and Machine Corporation
Dept. X, 4545 S. Western Boulevard
Chicago 9, Illinois

Please send me a copy of Bulletin HGB on Foote Bros. Hygrade Drives.

Name.....

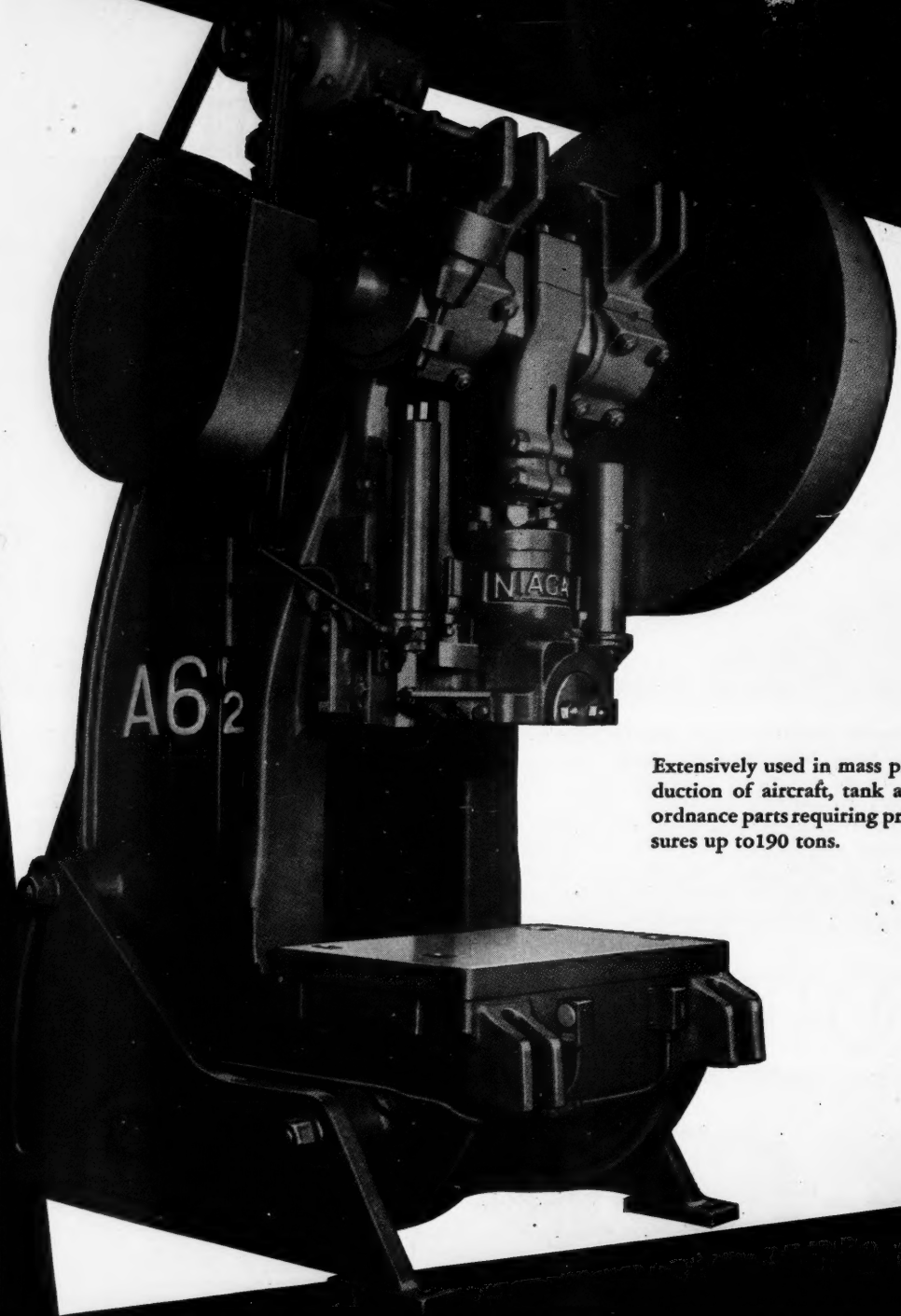
Company.....

Address.....

Position.....

City..... State.....

NIAGARA



Extensively used in mass production of aircraft, tank and ordnance parts requiring pressures up to190 tons.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

A COMPLETE LINE *of* INCLINABLE PRESSES

13 SIZES...

6½" to 1¼" Diameter Shafts

For your defense contract work, get Niagara presses to insure maximum output, long die life and uninterrupted production.

Widely employed in quantity production of small components for the aviation, ordnance and electronics industries.

Manufacturers of a complete line of sheet metal working equipment ranging from small hand tools up to large power operated machinery.

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

Drive at pug mill of Gladding McBean & Co. Safety guard removed for photographic purposes

The Problem:

The drive at the pug mill at the Gladding McBean & Company brick plant, Pittsburg, California, is so vital to their production it cannot be out of service for any length of time. It must operate under dusty conditions which induce slippage in ordinary belts. It must be able to take very severe pulsating loads.

The Solution:

With the installation of rugged BWH Bull Dog V-Belts the problems and difficulties were completely overcome.

* * *

Do you have a drive or V-Belt problem? Call us for Bull Dog V-Belts and a space saving, dependable, trouble-free installation.

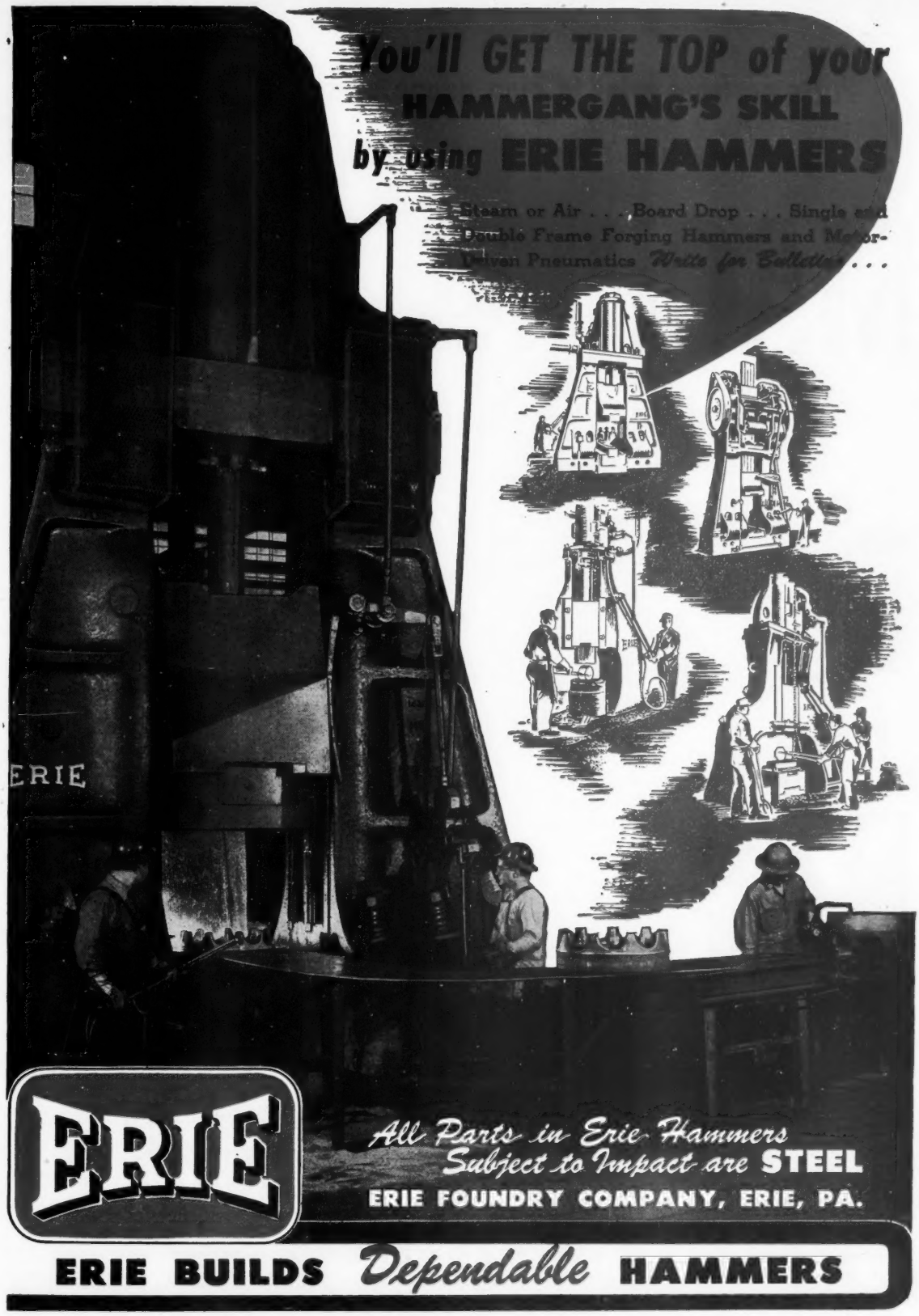
Another Quality Product of

BWH DEPENDABLE RUGGEDNESS

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. · P. O. BOX 1071, BOSTON 3, MASS., U. S. A.


You'll GET THE TOP of your
HAMMERGANG'S SKILL
by using ERIE HAMMERS
Steam or Air . . . Board Drop . . . Single and
Double Frame Forging Hammers and Motor-
Driven Pneumatics Watts for Battalion . . .
ERIE
ERIE
All Parts in Erie Hammers
Subject to Impact are STEEL
ERIE FOUNDRY COMPANY, ERIE, PA.
ERIE BUILDS Dependable HAMMERS

Parts go from print to plug gauge...fast

...with this better-than-ever steel bar

MACHINABILITY

• When parts go from print to plug gauge in the shortest possible time . . . then you *know* you've got steel bar MACHINABILITY.

With *your* automatics humming on production set-ups, bar stock has got to deliver.

That's why you'll hear that same familiar hum in famous Union Drawn machining laboratories, too. Production parts are running—on test. Parts that are designed to utilize all common operations of modern six-spindle automatics. Not just two or three or four . . . but all! Testing MACHINABILITY for you!

Research has established Union Drawn as "MACHINABILITY Headquarters." Research that includes years of actual production-line experience in customers' plants . . . observing, studying, analyzing and reporting every single fact relating to steel MACHINABILITY.

No wonder today's Union Cold Finished Steels consistently give you top ratings on feeds and speeds . . . long tool life . . . freedom from abrasive elements . . . high production rates . . . low unit parts cost.

Need help on set-ups, tooling, or any other phase of machining steel? . . . on cyaniding, carburizing, or other form of surface treatment after machining? You'll get it promptly from "MACHINABILITY Headquarters." Just contact your Republic District Sales Office, your Union Drawn Distributor, or write:

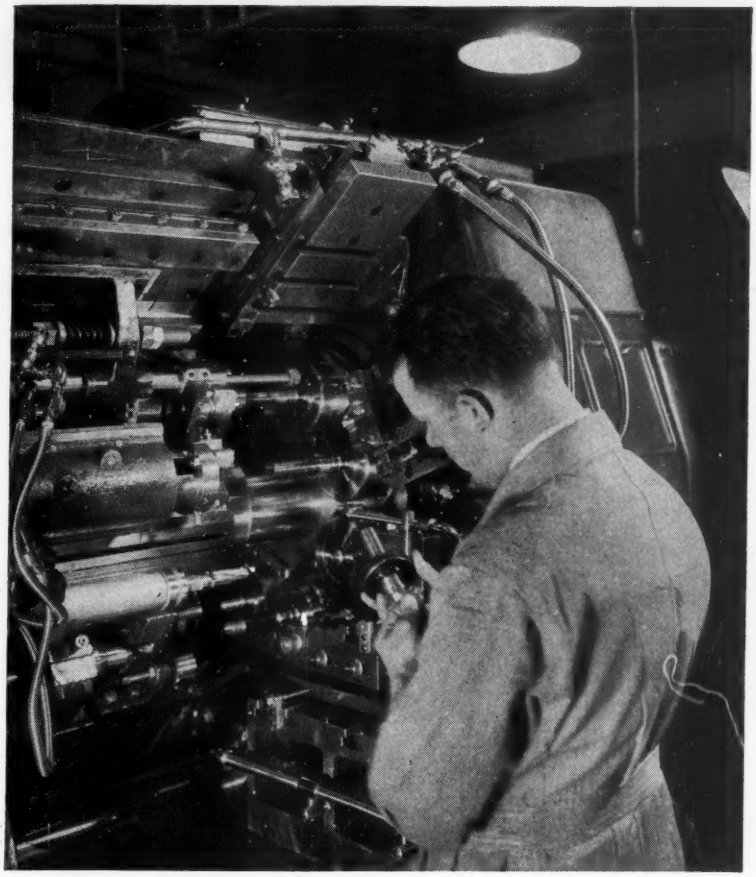
REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Quick Facts, For You

They're in your Union Drawn "Pocket Library." Six handy booklets, packed with facts, informative, interesting. Write for your free copies, today.

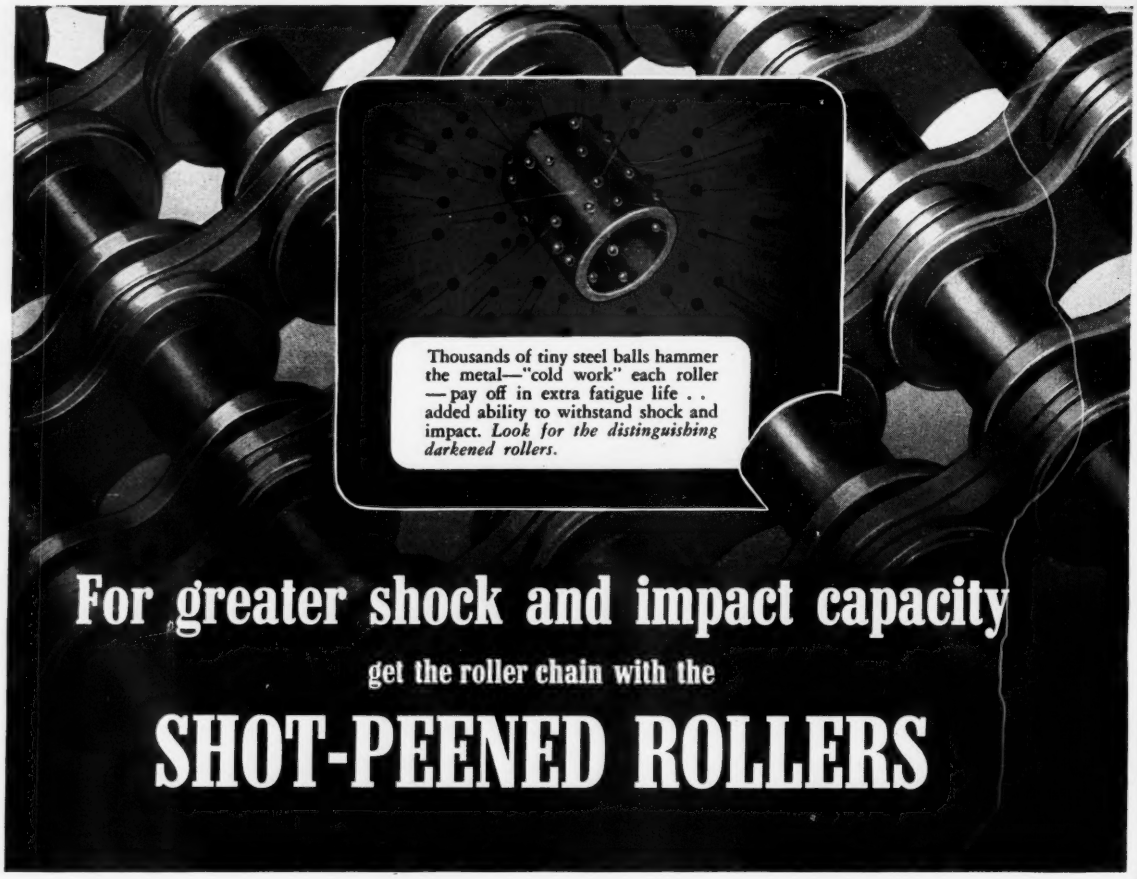
Republic
REPUBLIC STEEL
UNION COLD DRAWN
STEELS

Free-Machining Bessemer, Alloy and Enduro Stainless Steels
•
Union Cold Drawn Special Sections
•
Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting)



FOR STILL HIGHER PRODUCTION RATES

Ask your Union Drawn field man about the new, fast-machining grade, B-1113X. Where your equipment and parts design are such that heavier feeds and faster speeds are practical, "X" steel may help boost production still higher.


Thousands of tiny steel balls hammer the metal—"cold work" each roller—pay off in extra fatigue life . . added ability to withstand shock and impact. *Look for the distinguishing darkened rollers.*

For greater shock and impact capacity

get the roller chain with the

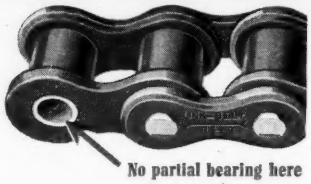
SHOT-PEENED ROLLERS

. . . one of the extra-wear features you get with every LINK-BELT Roller Chain

JUST as shot-peened rollers give you extra fatigue life—so do Link-Belt's exclusive lock-type bushings multiply roller chain's capacity to withstand shock loading. And there are many other engineering extras that make Link-Belt Precision Steel Roller Chain your best buy for drive and conveying service.

You can choose from the complete range of Link-Belt Precision Steel Roller Chain. Ask your nearest Link-Belt office for full particulars on single or multiple widths, in ⅜″ through 3″ single pitch, or double pitch, 1″ through 3″.

Lock-type Bushings increase ability to withstand severe operating conditions



No partial bearing here — bushing fits securely

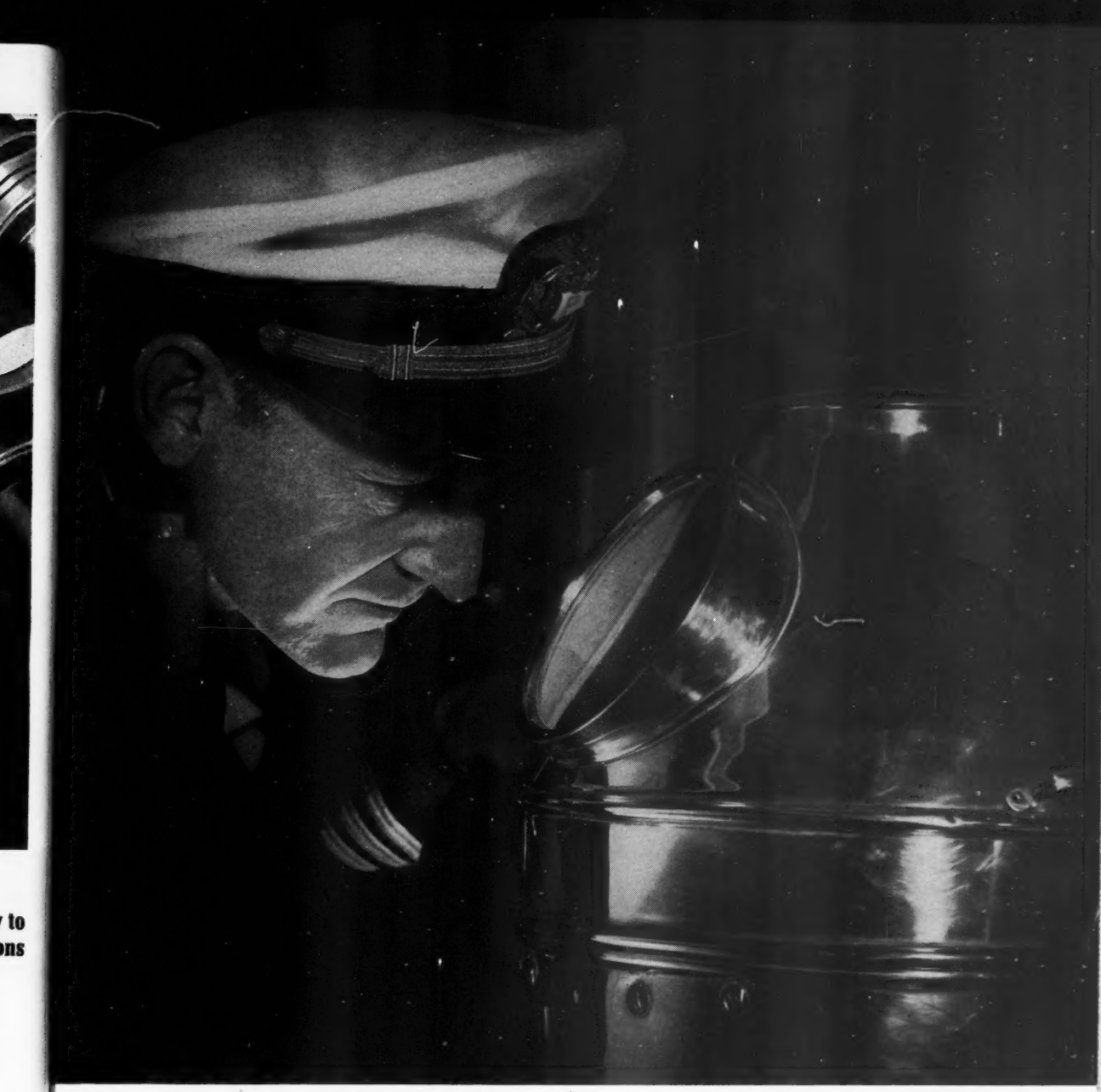
A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1″ pitch and double pitch roller chains through 2″ pitch. 12,696

LINK-BELT

THE SYMBOL OF QUALITY — LINK-BELT

PRECISION STEEL ROLLER CHAIN

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, factory branch stores and distributors in principal cities.



You Always Know Where You Are . . . with BRASS

You can always chart a true course in production and marketing, when you work with Brass. For its "working behavior" on any job is well-known, always reliable, never erratic. Yes, Brass is easy to get along with, whether you're fabricator or user. And you'll never be left high and dry . . . like a major manufacturer who was forced to try a substitute material during the recent copper "shortage" . . . and who wound up paying more than $10,000,000 in free replacement parts to angry customers.

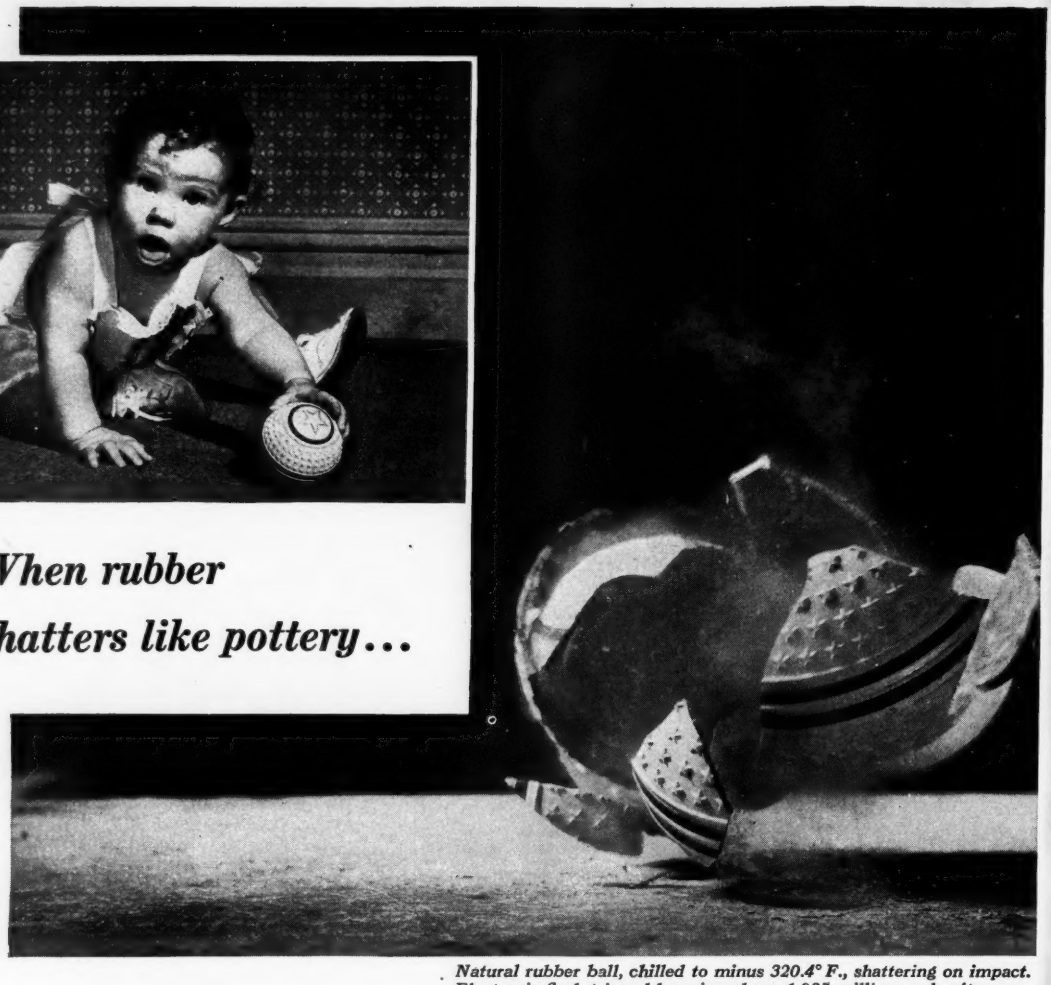
No, it shouldn't be long before there's a *shortage of shortages.* And so, in the words of the world's largest copper producer (a producer of many other metals as well): "On the basis of the facts, there is no need to consider long-range substitution of other materials for the red metal." For, when all is said and done, *there are* no *substitutes for Brass.* And if you are a user of Brass mill products, your inquiries are invited *now.*

• • •

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

When rubber shatters like pottery...



Natural rubber ball, chilled to minus 320.4° F., shattering on impact. Electronic flash tripped by microphone 1.035 milli-seconds after contact. Photos by Ralph Bartholomew, Jr.

Natural rubber *will* shatter, up in sub-stratosphere planes, at minus 50°F. Don't shiver; that's *warm* compared to temperatures some chemical equipment must take in stride.

Put yourself in the shoes of the man who designs an oxygen vaporizer. It must test 4200 pounds per square inch at minus 300°F.!

Or a helium liquefier that operates within 4 degrees of *Absolute Zero,* (which is exactly 459.6° below zero Fahrenheit).

Now that's cold. At temperatures like that, an orange spalls off in little chips, like granite. Steel brittles like a bit of glass.

In such a fantastic Jules Verneland, you discover that *one metal* and its alloys keep their toughness—ductility —clear down to 455° below zero F. Even the *"impact properties of weldments are essentially insensitive to temperatures as low as minus 320.4°F."*

So let's assume your problem is on the cool side, starting at 100° below zero and dropping off from that. You find the answer—as did the designers of the oxygen vaporizer and the helium liquefier mentioned above — in Nickel or a nickel alloy. (These two jobs were solved by Monel, an Inco Nickel Alloy.)

Let's Talk about Your Problem

Is it complicated too by sub-zero cold—or high heat, or corrosion, or some other difficulty?

Now is the time for us to get together with you or your engineers while our staff of metal specialists can carry out whatever research is needed to solve it. You can mail the outline of your problem direct to them for study by addressing it to The International Nickel Company, Inco Nickel Alloys Dept., 67 Wall Street, New York 5, N. Y.

Then the answer can be ready at your hand when these critical times are over, and Inco Nickel Alloys are available in any quantity for any use again.

THE INTERNATIONAL NICKEL COMPANY, INC.

INCO TRADE MARK **Nickel Alloys**

Monel® • "R"® Monel • "K"® Monel • "KR"® Monel • "S"® Monel Nickel • Low Carbon Nickel • Duranickel® Inconel® • Inconel "X"® • Incoloy® • Nimonics

June 30, 1952

Strike Slows Controls Bill

The steel strike, not legislative inertia, is the main reason why congressmen are having such a tough time with the Defense Production Act, the current extension of which expires at midnight tonight. The full effect on the economy of the labor troubles cannot yet be fully appraised, so the legislators were undecided on how much to let up on controls.

Premature?

The steelworkers claim that premature—and inaccurate—disclosure of the plants to be partly reopened to produce 250,000 tons of steel for defense a month is one reason why they are delaying approval of the action on which they once promised a fast o.k. A business newspaper carried the list. Mr. Murray said he had to sell the idea to his locals, especially to the ones who aren't involved, and the disclosure spoiled his sales talk. The locals are getting tougher even about letting union members go in to do needed maintenance work. The workers on such jobs have to kick back part of their pay to the local strike fund.

Construction: Still Good

Construction prospects are still good despite the action by NPA in putting aside its pledges to ease curbs July 1. The steel strike forced the agency to renege. But more copper and aluminum are still available for construction. When the whole picture is finally cleared, this is probably what will happen: NPA will have to continue its restrictions on amusement and recreational building, but most other relaxations will come before the end of the year. A total construction volume of $32 billion in 1952 is still possible.

Steel Lack Hits Oil

Some 5000 tons of oil country tubular goods a day are being lost because of the steel strike. That's going to do no good for the nation's drilling program, scheduled to go at the annual rate of 55,000 new wells this year. That many wells this 12 months means more requirements for tubular goods than last even if the same number of wells were drilled. Depth of the wells is increasing 100 feet per annum. The drilling program calls for 60,000 new wells in 1954 and 65,000 in 1955.

Definition: Lock-Out

Take a good look at a labor lock-out case involving General Cable Corp. and the independent United Electrical Workers. The arbitrator, Harvard Professor James J. Healy, ruled in favor of General Cable in a decision that could go far in setting up a definition of just what a lock-out is. Mr. Healy ruled that these three characteristics all must be present if there is a lock-out: All or part of the place of employment must be closed by the employer; the action must be

Production-Engineering News—p. 75 The Market Outlook—p. 117

on the offense; the purpose of the action must be to deprive workers of employment to gain economic concessions from employees. The first factor was the only one characterizing General Cable's action, so the union lost.

Accent on Nonferrous

NPA is toying with the idea of lifting the levels of permitted inventories of copper now that more of the metal is available . . . Order M-9 restricting zinc inventories was revoked June 27 . . . The import duty on lead, reimposed June 26 by President Truman, will be absorbed by foreign sellers.

More Aid for Heavy Presses

The heavy press program for the Air Force is dragging, so watch for more attention on that from NPA. Already a new Direction 14 to CMP Regulation 1 has come out. It provides for the making of allotments for heavy castings for a period of seven months in advance. More help is also planned.

They Don't Like It

Machine tool builders don't like the news that Chevrolet, with the help of Mutual Security Agency, is getting 172 radial drills of standard design built for it by GST, a French machine tool firm. Chevrolet will use the equipment at its Tonawanda, N. Y., plant to produce the Wright R-3550 aircraft engine. Ten drills have already been delivered and the rest of the $1 million order will be shipped over the rest of the year.

Straws in the Wind

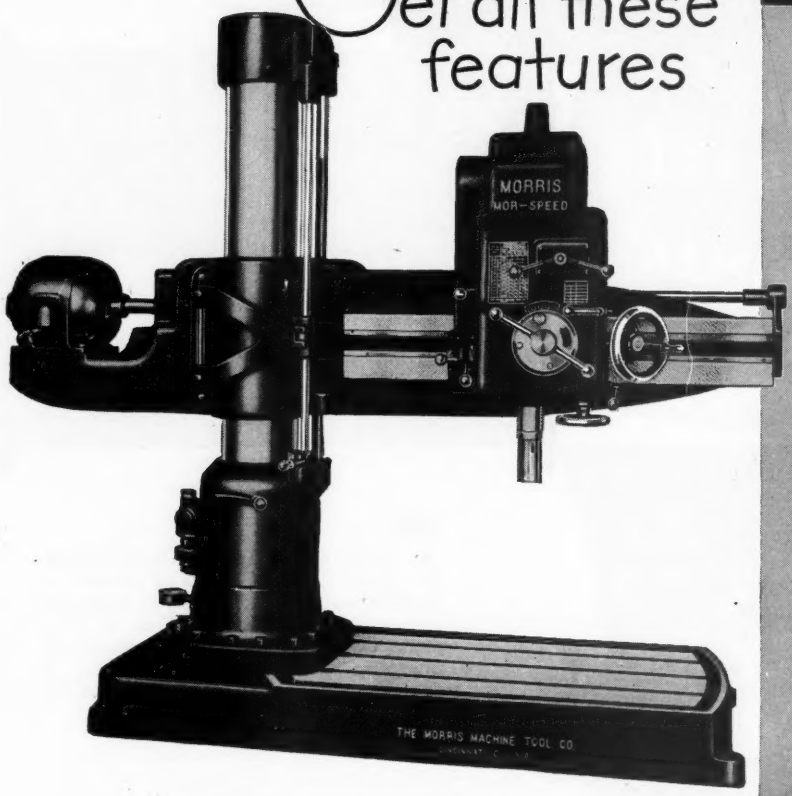
A storm knocked out nine of Aluminum Co. of America's 13 aluminum smelting lines at Massena, N. Y.; 500,000 pounds will be lost a day until the damage is repaired, probably in about two weeks . . . Kaiser-Frazer Corp. may get another RFC loan . . . Backers of the Riverlake belt conveyor project are readying a third appeal to the Ohio legislature for the right of eminent domain . . . Fansteel Metallurgical Corp. cut prices 11 to 46 per cent on its seamless molybdenum tubing . . . Britain will aid Canada to build the St. Lawrence Seaway project now that the U.S. is out of the picture . . . M. B. McCafferty, on leave from Wheeling Steel Corp., today succeeds J. Douglas Darby, on leave from U.S. Steel Co., as director of NPA's Iron & Steel Division.

What Industry Is Doing

The steel strike cost the nation $1.5 billion so far (p. 43) . . . Mobilization officials find steel losses tough to handle (p. 43) . . . Ellis Arnall claims that the steel companies will get only the $3 Capehart formula increase, no matter how the strike is settled (p. 44) . . . Brass mill strikes spread throughout the Connecticut Valley (p. 45) . . . It will take some doing to have enough metals in 1975, when the gross national product is twice as big, says the President's Materials Policy Commission (p. 46) . . . Light-conscious industries keep fixture makers happy (p. 50) . . . Business gets acclimatized to high altitude living (p. 51) GE opens switchgear development laboratory (p. 59).

for production or tooling drilling reaming or tapping

Get all these features



CENTRALIZED CONTROLS

Every control in reach, easy to operate . . . saving operator effort and production time.

VARIETY OF SPEEDS AND FEEDS

A better job faster because the right combination is easily selected.

AUTOMATIC LUBRICATION

Built-in accuracy maintained and protected for years on end by positive lubrication.

GREATER RUGGEDNESS

Every part engineered for maximum strength and balance, assuring long, useful life.

MORE AUTOMATIC STOPS

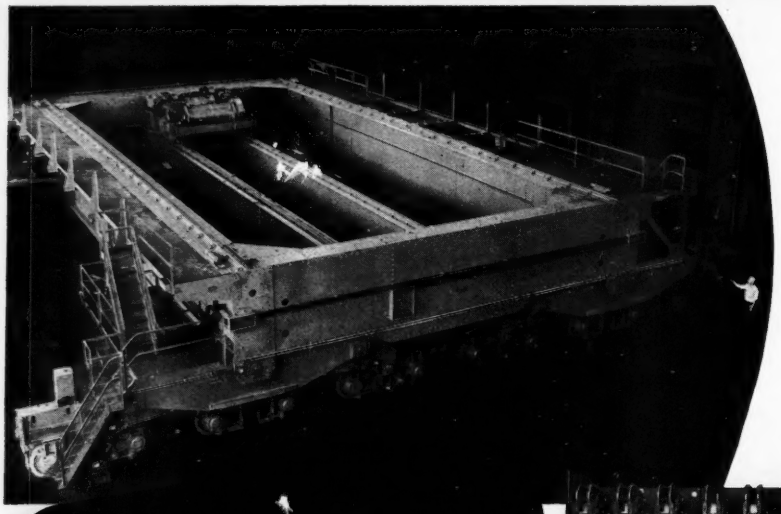
Save time and reduce manual operations to an absolute minimum.

You'll find MORRIS Mor-Speed RADIAL DRILLS' accuracy and low cost production an important advantage in the fight against rising prices. Write for your copy of the latest Radial Drill Catalog today.

a better product at less cost —with precision PLUS *production*

Morris

THE MORRIS MACHINE TOOL COMPANY, 941 HARRIET ST., CINCINNATI 3, OHIO

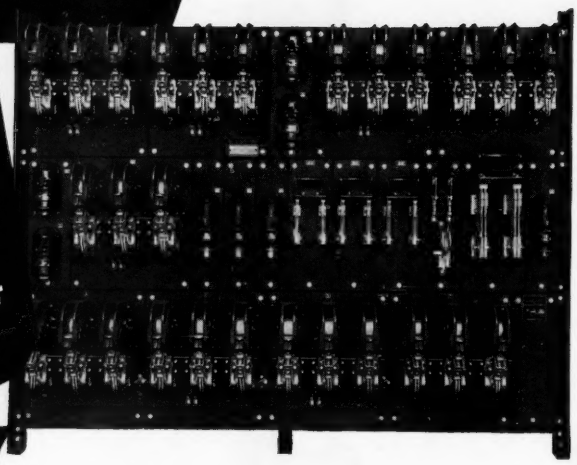


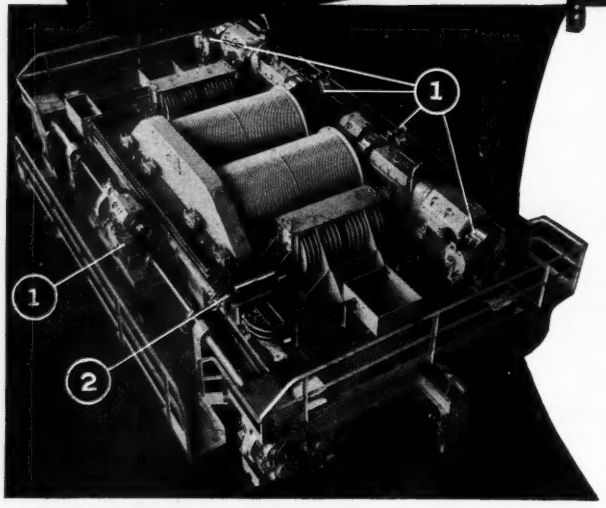
350-ton Ladle Crane on erection floor of Morgan Engineering Company.

6 MOTORS CONTROLLED AS 1

UNDER

EC&M TRIPLEX TIME-CURRENT Controller





The above EC&M Triplex Time-Current Controller controls 3 sets of motors in parallel, each set consisting of 2 motors connected in series. Uniform current peaks during starting, accelerating and plugging operations are maintained in each set of motors by this EC&M Method of Control.

The trolley for this crane (at left) is also EC&M equipped: Type WB Brakes (1) on the hoist and trolley motors, and EC&M Duplex Safety Hoist Stop (2) for the hoist motors.

When Buying Cranes It Pays To Specify E&M *Control*

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

July 4—1776 and 1952!

Next Friday will be the 176th anniversary of the signing of the Declaration of Independence. Many of us would do well to make it a patriotic ritual to read that famous document carefully. We should note particularly the 18 specific charges of tyranny against King George III which the authors of the declaration "submitted to a candid world."

The very first charge was that "he had refused to assent to laws, the most wholesome and necessary for the public good." Today, largely because our federal government has become too large and too powerful, we witness a President who "has refused to assent to laws." His efforts to avoid use of the Taft-Hartley Act is the latest of several examples.

Another charge against the king was that "he has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance." The poor king did just that, but what he did was "peanuts" compared with our present government's "multitude of new offices" and "swarms" of bureaucrats which "harass our people" and "eat out their substance" in this year of 1952.

In 1776 the authors of the declaration charged the king with "exciting domestic insurrections amongst us. . . ." This was a true charge, but did King George ever excite insurrections comparable in their ultimate sinister effect to the discord caused by our federal government in its deliberate fomenting of class hatred and enmity since 1933?

There are other charges against the king which have their modern counterparts in abuse of power by our government in Washington. The lamentable fact is that throughout the years we have simply exchanged one form of tyranny for another. We are oppressed by a too-powerful federal government instead of by a despotic crowned head.

The signers of the Declaration of Independence staked their "lives, fortunes and sacred honor" in support of their decision to be free from one form of tyranny. Can't we pledge ourselves to support another declaration of independence—one that will free us from the tyranny of too much power in Washington!

E. L. Shaner

EDITOR-IN-CHIEF

RESENTMENT MOUNTS: As this is being written, the House has not completed its action on the bill extending controls. However, the debate has indicated an increasing amount of resentment against Mr. Truman, Mr. Murray and the Wage Stabilization Board. Many representatives feel that the two men and the agency bungled affairs and brought on the present strike nedlessly.

This resentment was heightened by three

LORD HALL LIBRARY

statements uttered recently by Messrs. Truman and Murray. One was the intimation by the President that possibly the steel union members would not abide by an injunction granted under the Taft-Hartley Act. Another was Philip Murray's statement in Gary that Mr. Truman told him last December that if steelworkers would postpone their strike scheduled for Jan. 1 they need not fear imposition of T-H injunctions by the courts. This certainly was a "deal." Mr. Murray's statement at Gary that "the Taft-Hartley Law does not manufacture steel" appeared to some observers to be a threat of disobedience to T-H.

* * *

RATES 1952 GOOD YEAR: In his midyear check-up of the health of the metalworking industry, the economic doctor has examined the patient thoroughly and has conferred with numerous specialists and consultants. He comes up with the pronouncement that the patient's pulse is steady, respiration excellent, blood pressure a bit on the high side, and weight a few pounds above normal.

This is the editors' way of introducing a midyear report on the short term outlook for the metalworking industries. There will be some readers—possibly those whose own plants are currently facing difficulties—who will be inclined to think that the forecast for the year 1952 is too optimistic. One way for them to test their ideas will be to check their thinking against the charts (pp. 51-54) showing estimates of defense spending, expenditures for new plant and equipment, metalworking sales, construction outlays, gross national product, automobile output, industrial production index, etc.

These estimates, all of which are made in the light of first-half experience and some tangible indications of last-half trends, add up to an encouraging total for the whole year.

* * *

UNITED STATES IN 1975: A government mission headed by William S. Paley, chairman of Columbia Broadcasting System, has issued a report entitled "Resources for Freedom," which is an ambitious attempt to forecast our nation's economic growth and its materials needs. Here is the Paley report's picture of the United States in 1975:

Population, 193 million; labor force, 82 million; number of homes, 62.5 million; automobiles on the road, 65 million; steel output, 147 million tons of ingots and 110 million tons of finished steel; aluminum consumption, 4.5 million tons; copper consumption, 2.5 million tons; petroleum consumption, 5 billion barrels; and consumption of electricity, 1.4 trillion kilowatt-hours.

These are arresting figures and they should cause us to realize that the industrial potential of our nation is tremendous if we will use our heads to avoid monumental mistakes. The Paley report (p. 46) deserves careful study by every responsible industrial executive.

* * *

TI ORES ARE ABUNDANT: An important factor in connection with the increasing use of titanium is that the ores from which this desirable metal is extracted are plentiful and widely scattered throughout the world. Fortunately large deposits exist in the United States and Canada.

The principal titanium ores (p. 76) are rutile, ilmenite, arizonite and titaniferous magnetite. Titanium metal comprises 57 per cent of the compound rutile, 32 per cent of ilmenite, 36 per cent of arizonite and only 6 per cent of titaniferous magnetite. Rutile in found chiefly in Australia, Brazil and Florida; ilmenite in Quebec, Japan, India, Norway, Russia, and the United States. A reserve of titaniferous magnetite has been found in Wyoming. Barring discovery of new sources of rutile, much of the titanium of the future probably will come from ilmenite ores.

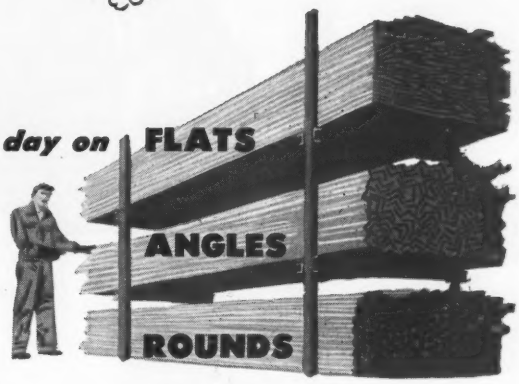
* * *

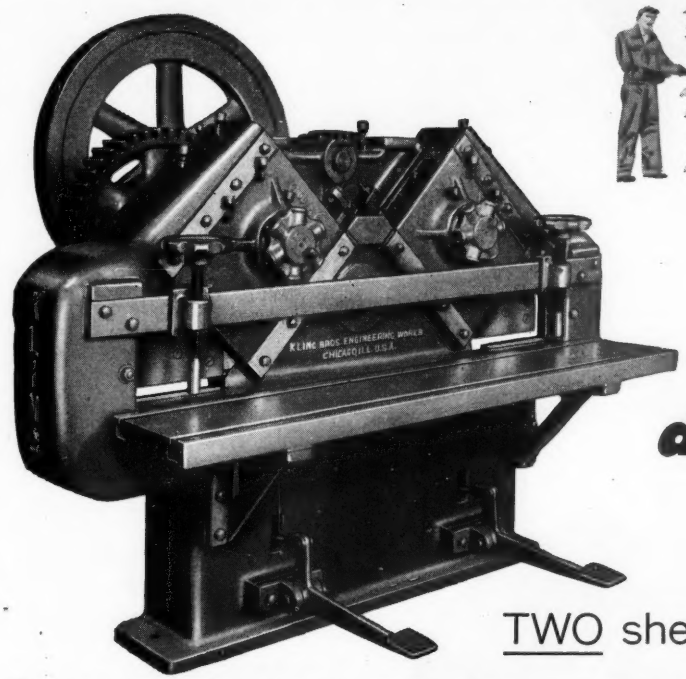
THEORY VS. PRACTICE: Last week when the House was first threatening to kill all wage and price controls, Price Stabilizer Ellis Arnall told interviewers on a television program that if the proposal to abolish wage and price ceilings was written into the law, the steel strike might end. This opinion was based upon the assumption that if all government price controls were removed, steel companies could increase prices enough to cover the cost of increased wages.

This sounds fine in theory, but in reality there are forces other than federal price ceilings which affect prices. One important one—which Washington usually ignores—is the law of supply and demand. In a buyer's market, there would be strong resistance to any attempt to raise stel prices appreciably.

It's the BUSIEST machine in the shop!

...gives more cuts per day on





Kling double angle shears

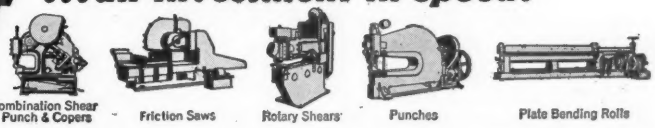
TWO shears in ONE machine!

If you're using obsolete, slow-poke methods of shearing, the Kling Double Angle Shear can help you save time and money. This modern compact machine is designed for high speed, high production shearing on both long and short run jobs. Many metal fabricating plants and steel warehouses have found the Kling Shear to be the workhorse of the shop. For instance, one machine will shear round bars and bar angles on the left side while the right side can be used for structural angles and flat bars. The machine is built with the speed and power to handle the bulk of your shearing requirements. For shops with considerable mitre shearing work, Kling Double Angle Shears can be mounted on a turntable to facilitate handling. Automatic hold downs and one-shot lubrication can be furnished when desired. Sizes to handle angles up to 8" x 8" x 1½".

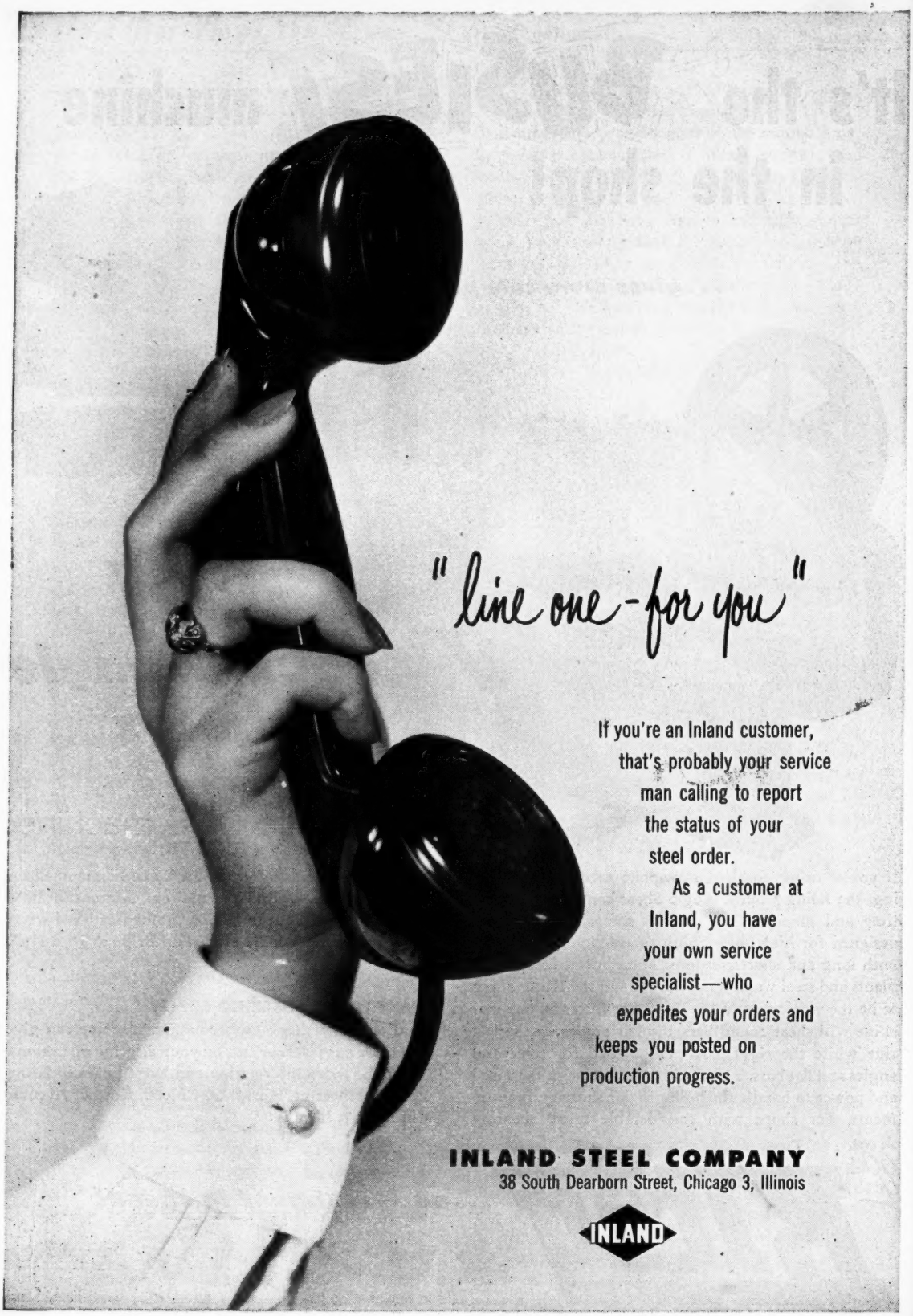
WANT TO CUT SHEARING COSTS?
Find out how this high-production machine can give you more cuts, cleaner cuts on your shearing operations. Write for more information and latest bulletin. Kling Bros. Engineering Works, 1324 North Kostner Avenue, Chicago 51, Illinois.

in our 60th Year

Kling ...an investment in speed!



5606


"line one - for you"
If you're an Inland customer, that's probably your service man calling to report the status of your steel order.
As a customer at Inland, you have your own service specialist—who expedites your orders and keeps you posted on production progress.
INLAND STEEL COMPANY
38 South Dearborn Street, Chicago 3, Illinois
INLAND

Strike Losses Hit $1.5 Billion

Half that cost is loss of steelworker wages and steel sales. The other half is the loss to steel users thus far because of production curtailments

LOST already because of the steel strike: More than $750 million in finished steel sales and steelworkers' wages in the steel industry alone; probably an equal amount among steel users because of production cutbacks and lost wages.

More losses must be expected. Even when a strike ends, it takes up to two weeks to get back into full production. Paradoxically, steel users will feel the pinch the worst as the workers go back.

The Pressure Is On—Late last week the pressure was bad enough. More and more companies announced cutbacks, particularly in automotive lines and other areas where large tonnages are used. As of today, inventories generally could last about a week, but product imbalances are the problem now and causing most of the pain. Many a company has plenty of steel of one variety, but nothing left of another, so all operations must halt.

Until late last week, public opinion was not strong to get the strike settled. But then anxiety suddenly mounted—the anxiety of consumers, banks, steelworkers, the steel companies and the government all interacting to change the climate almost overnight. *The Beaver Valley Times,* a newspaper with a heavy circulation among steelworkers in the Aliquippa, Pa., area, took a poll and found that 88.3 per cent of the 798 turning in ballots voted to return to work and accept the steel companies last offer of 22 cents an hour, but no union shop.

By July 7?—As of last Thursday, no one knew just how the workers would be persuaded to return to the mills, but the majority of industry executives and labor analysts interviewed by STEEL were betting that they would be back by July 7. A Taft-Hartley injunction could be one way to resume steel work. The House at last voted to "request" Mr. Truman to use T-H, just as the Senate did earlier. The President claims the "request" does not necessarily mean he must use the law. Another way to get mills rolling again could be a settlement. The union retreated slightly in its stand about the union shop and that may be a sign that all sides are ready to give a little. Rumors about settlement and talk of individual negotiation by this and that big company for a separate peace flew thick and fast last week. Although all those reports were denied by parties involved, such rumors are common on the eve of a break in a strike situation.

A few more smaller companies have signed with the steelworkers. They include Rotary Electric Steel Co., which signed on terms similar to those offered by big steel firms June 9, and Blaw-Knox Co., Pittsburgh Forging Co., Jessop Steel Co., Follansbee Steel Corp., Oliver Iron & Steel Corp. and Firth Sterling Steel & Carbide Corp. on terms close to WSB recommendations. Armco Steel Corp. has agreed to give 25 cents to independent bargaining agents at five plants employing 11,500. The Armco plants organized by Mr. Murray's cohorts are still down. Weirton Steel Co. signed on much the same terms with the Independent Steelworkers Union at its facilities.

Strike Losses:
Wages—$173.2 Million
Finished Steel—$583.0 Million
To Steel Consumers—$750 Million
Estimated by STEEL

Invitation to Insomnia

Mobilizers are losing sleep trying to figure out how to handle the steel loss

WAYS and means of handling the steel loss are keeping mobilization officials awake nights.

Short-term plans aren't working out too well. No substantial amount of finished tonnage is coming out of the 132 mills and warehouses that government, industry and the union agreed to open.

Not There—In the mills no large tonnage of finished exists. The strike began June 2 just after the workers had cleared out as much finished as possible, a regular end-of-the-month practice. What's more, some of the finished steel is not suitable for defense purposes. A third factor limiting the effectiveness of that action is the refusal of some locals to co-operate. The local at U. S. Steel Co.'s Gary, Ind., works is recalcitrant, as is the one at Bethlehem Steel Co.'s Lackawanna, N. Y., plant. Others aren't co-operating either.

The plan to operate enough struck facilities to produce 250,000 tons of steel monthly for defense (STEEL, June 23, p. 43), also hit a snag and late last week the steelworkers refused to give an O.K.

Long-Term—For the long run, the problems are just as knotty. Mobilizers figure the steel loss will amount to more than half a calendar quarter's production even if the walkout ends tomorrow. Counting the other walkouts in late April and early May, we lost 9.1 million tons of steel ingots as of June 28. The trouble in steel allocations

is that CMP will move into the third quarter with better than 11 million tons in uncashed tickets. All third-quarter tickets for steel were issued well before the strike. That means that no part of the loss will be made up in the three months ending Sept. 30 and NPA will go into the fourth quarter with what amounts to an unmanageable carryover.

Delayed — A decision is overdue on fourth-quarter program determinations if leadtime requirements for steel, copper and aluminum are to be satisfied. Advance allotments for the fourth quarter are at 100 percent for the military and 80 percent for almost everybody else. If you add the steel loss to the advanced allotments, there would still be a carryover at the end of the year of substantial proportions even though not a single new ticket were issued.

The Requirements Committee will meet July 1 to try to make a decision on whether fourth-quarter allotments ought to be reduced in the attempt to make up as much of the loss as is possible or whether the loss ought to be spread out over two or three calendar quarters. The chances are that a decision will be reached to spread the loss.

Preference—Some kind of a preference will have to be worked out to take care of extreme military needs. Present plans call for a set-aside order which will require the mills to hold substantial parts of their tonnage to meet A-E, B-5 and Z-2 orders until the expiration of leadtime. At that time, mills could use any part of the set-aside which hasn't been taken up to fill other authorized controlled materials orders. There is a lot of support for the order but not from the military and other agencies which must struggle with the set-aside percentages.

Plans also call for the maintenance of the super priority for orders carrying the designation A-1 through A-7, C-3, and E-1, E-2 and E-3 to be sure that military steel goes first to filling the requirements for ammunition, guided missiles, landing craft, jet engines and other top urgency programs of the Defense Department and the Atomic Energy Commission.

OPS Eyes Steel Prices

Arnall is adamant on $3 hike as agency probes price boost impacts on products

OPS BOSS Ellis G. Arnall continues adamant in his stand that no matter how the steel strike is settled, the industry should be allowed no more than the $3 in relief permissible under the Capehart formula.

His agency will conduct a series of product surveys to determine the effect of higher manufacturing costs on individual products. Those surveys are to include the costs of all but the high-cost producers.

To Be Decided—After the facts have been established, across-the-board industry adjustments will be determined for the individual products. Even though that will enable some producers to fare better than others, such procedure is regarded by OPS as the soundest approach. Later, similar studies will be made to determine the extent to which steel fabricators may adjust prices upward on their products to allow for higher costs of material and labor. If the agency makes its study on the basis of the director's position, it will figure on a base increase of about $3 a ton. "It is estimated," said Mr. Arnall at his latest press conference, "that the proposed wage increases recommended by WSB would cost the steel companies a maximum of $4.67 a ton on the average for the 18 months of the contract. Even on the most liberal basis of figuring, the cost would be less than $6 a ton. Deducting a Capehart increase of $3 a ton from the maximum wage increase of $6 a ton leaves $3 a ton to be absorbed by the steel companies. They can do that easily."

Convincing—The steel companies may not have convinced Mr. Arnall, but they believe they have persuaded other Administration men that WSB hikes will mean a cost increase of close to $12 a ton. The unofficial word still is that the steel companies can get a price boost of about $5.50 a ton.

Thus far, only nine smaller iron and steel products firms have applied for Capehart increases — Crown Cork & Seal Co., Baltimore; Pittsburgh Tube Co., Pittsburgh; Sweets Steel Co., Williamsport, Pa.; Taylor Forge & Pipe Co., Chicago; Judson Steel Corp., Emeryville, Calif.; American Swedo Iron Corp., Danville, Pa.; Spencer Wire Corp., Union, N. J.; Spotnails Inc., Evanston, Ill.; and Snell-Jones Tack Corp., Brockton, Mass. Rumors on the rounds last week that Armco Steel Corp. had applied are denied by both Armco and OPS.

Steel Nets a Nickel per Dollar

Average profit on a dollar of steel sales dropped to less than a nickel in the first quarter, says the American Iron & Steel Institute.

Iron and steel companies representing 88 per cent of ingot ouput netted 4.7 cents per sales dollar in the first quarter, from 5.7 cents in the preceding quarter and 6.2 cents in the first quarter, 1951.

This drop of 25 per cent over the year accompanied a 22.5 per cent decline in total net income to $2250 million, despite record-high production. Rising costs on purchased materials and employment were mainly responsible for the reduction in net income. The effect of these cost increases lowered the industry's federal income taxes to $210 million in the first quarter, down $70 million from a year ago.

Armaments: 1-Day Steel Output

Direct shipments of steel to makers of guns, tanks, ammunition and similar military goods averaged only 187,000 net tons per month in the first four months of 1952, says the American Iron & Steel Institute. That monthly average equals one day's output of finished steel at the four-month rate. Even at the reduced output rate during the first two weeks in June of 800,000 tons of finished steel products monthly, this monthly output is equal to the steel used in armament during the entire first four months of this year.

Scrap Prices Sag as Use Dips

Undertone of the scrap market is easy. Practically no new con-

tracts are being made and sales immediately following settlement of the strike likely will be made at below-ceiling levels. This situation is expected to prevail for only a few weeks, or until dealers unload heavy accumulations which cannot now move to furnaces.

Among counteracting factors are: Decline in generation of industrial scrap as factories slow down operations due to lack of steel and others curtail for vacations; the fact that more scrap will be required when mills reopen due to the expected shortage of pig iron; a high rate of steelmaking later in the year.

The easier scrap supply situation caused National Production Authority to relax collection efforts under its dormant scrap program. Inventories of scrap at consumers' plants slightly exceed 60 days' requirements. NPA's Salvage Division is reducing its staff, preparing to revoke Auto Wreckers Order M-92, and discontinuing publication of its weekly pep sheet "Touching the Bases," which was distributed to the scrap mobilization committees.

Edward W. Greb, director, Salvage Division, warns that another tight scrap situation may come about again. He requests all the committees to remain mobilized and prepared for further action should future conditions require another scrap mobilization drive.

Ore Strike Cuts Winter Steel

Unless the ore miners' strike is ended immediately, the nation's steel mills probably won't get enough ore for capacity operations next winter, says Alexander C. Brown, president, Cleveland Cliffs Iron Co., Cleveland.

"Every day that the iron ore mines are shut down by this strike, a half a day's ore supply for winter steel production is lost," says Mr. Brown pointing out that the lake ore shipping season is only seven months long.

Rail shipments of ore would not supply the needed ore when the miners' strike is ended. This would take away from other essential defense industries the needed freight cars at a time when the nation's car supply is low, he believes.

Adding more Canadian vessels to the ore fleet after the strike wouldn't nearly make up the loss.

"Last season when a maximum tonnage of iron ore was needed, every effort was made to have Canadian ships bring down every ton possible without prejudicing the essential movement of grain. Canadian ships brought only a little over a million tons from American mines to American furnaces," he says.

This compares with a tonnage loss of about one million tons per week due to the strike. Lake carriers moved a record tonnage of 3,125,969 in the week ended June 2, preceding the strike. In the week ended June 9, lake shipments of iron ore dropped to 1,565,739 tons.

Strikes Spread in Brass Mills

Scovill, Seymour Mfg., Bristol Brass, American Brass, Waterbury Companies, Waterbury Rolling Mills, Wells and others are all involved in strikes or threats of strikes

LABOR DAY is coming early in the brass mills, too. Strikes are spreading through the Connecticut Valley as separate negotiations between the UAW-CIO and some 18 brass companies flounder.

More than 5000 employes at Scovill Mfg. Co., of Waterbury, walked out June 21. At Seymour Mfg. Co., a strike of some 700 workers is now in its third week. Also involved in strikes or threats are Bristol Brass Co., American Brass Co., Waterbury Companies Inc., Waterbury Rolling Mills, A. H. Wells Co., Plume & Atwood Co. and others.

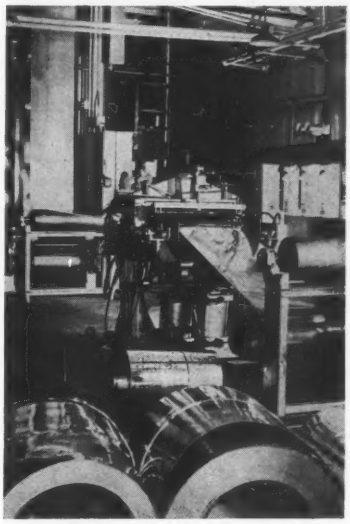
The Issues—Negotiations for a new contract were opened nearly nine months ago. UAW is seeking a five-year contract providing an 11-cent wage raise retroactive to Oct. 15, 1951, as okayed by WSB, union shop, a four-cent annual improvement factor, cost of living escalator clause, pension program and other benefits. In addition the union wants a higher straight hourly boost, saying the 11 cents was for last year's, not today's, conditions.

The companies generally want a two-year contract, flatly refuse the union shop demand and annual improvement factor.

Some of the companies won't accept the pay boosts on a retroactive basis.

Scovill, against union opposition, made the 11-cent an hour pay boost effective in last week's pay checks, over the objections of the union.

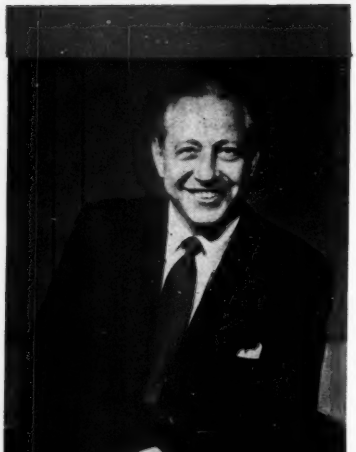
Union Success — Strengthening UAW's hand was success reached with Mueller Brass Co.,Port Huron, Mich., where the union claims a five-year contract with "all concessions" was obtained. The Mueller agreement gives present employees a choice of union affiliation but makes membership mandatory for new workers after a period.



CONNECTICUT VALLEY MILL
. . . vacation pay during a strike

As negotiations broke off with some companies, the questions of vacation pay and maintenance of insurance premiums were left in mid-air.

New Pitch—Brass mill vacations start this week, and the workers want vacation pay while on strike. June 30 was the deadline set by the CIO Copper & Brass Union in Detroit for all companies negotiating with UAW to make a decision.



WILLIAM S. PALEY
Chairman of the President's Materials Policy Commission

Metals Demand by 1975

. . . in the most ambitious government attempt yet to forecast the nation's future materials needs and economic growth, the President's Materials Policy Commission issued its five-volume report, "Resources for Freedom"

FINISHED STEEL DEMAND

END-USE	1950 Consumption (million short tons)	1975 Percentage Increase Projected	1975 Projected Consumption (million short tons)
Military and A. E. C.	1.3	100	2.6
Residential construction	2.1	15	2.4
Private nonresidential construction	6.1	50	9.2
Public construction	3.1	50	5.2
Oil and gas	6.3	100	12.6
Containers	6.1	60	9.8
Railroads	5.0	100	10.0
Farm machinery	2.9	0	2.9
Other machinery and equipment	9.4	50	14.1
Ships	.3	0	.3
Automobiles and trucks	16.4	33 1/3	21.9
Maintenance, repairs, and operations	4.0	100	8.0
Consumers' durables	5.0	50	7.5
Allowance for exports of fabricated steel			3.5
Total	68.0	62	110.0

IRON AND STEEL: The industry should be able to meet all demands, estimated at 147 million net tons of ingots and 110 million net tons of finished steel in 1975. The commission recommends: Accelerated amortization on new facilities, consideration of pig iron stockpiling.

ALUMINUM: Big metal of the future. Demand in 1975 should be 3.6 million tons a year as compared with 920,000 tons in 1950. World demand will increase in proportion. It is expected that we will import foreign aluminum. We should not neglect domestic production, though. Reason: Wartime needs will continue far ahead of peacetime needs. Thus, the government should have a leading hand in developing the industry.

COPPER: The 1975 requirement at home will be about 1.8 million net tons. Domestic production cannot be much above 800,000 tons annually (somewhat less than we produced in 1950 and 1951). And that's the catch. The remainder must be imported. That means production in other free nations will have to be at least doubled—clearly a prospect for a definite government program.

ZINC, TIN, LEAD: We must stockpile and work toward an increase in the free world output.

WILL WE have enough metals to meet all our demands in the year 1975—when the gross national product should be approximately double that of 1950?

The answer is: Yes—but it will take doing.

Problems Ahead—At home we will need intensified exploration for new mineral deposits, development of existing ones. We will have to discover improved processes for treating low-grade materials. In many minerals, the domestic output will remain stationary or recede. That means we will have to import more minerals—and with it solve many attendant problems. To do the job, a much more intelligent, comprehensive and coordinated national minerals policy than the present haphazard one will have to be created and administered.

That, in the main, is the picture presented in the 5-volume, 813-page report of the President's Materials Policy Commission, appointed Jan. 22, 1951, with William S. Paley, president, Columbia Broadcasting System, as chairman. Other members: George Rufus Brown, executive vice president, Brown & Root, Houston, Texas; Arthur H. Bunker, president, Climax Molybdenum Co., and president, Radium Co. of Colorado; Eric Hodgins, managing editor, *Technology Review;* and Edward S. Mason, dean Graduate School of Public Administration, Harvard University.

Big Blueprint — Recommendations which stud the report represent a blueprint both for Congress and for the chief executive. They call for an intensive program of topographic and geologic mapping, basic research to improve techniques and equipment for minerals

CONSUMPTION OF MATERIALS

MATERIALS	1950 CONSUMPTION Total	Scrap	New	PROJECTED 1975 CONSUMPTION Total	Scrap	New	PERCENTAGE INCREASE Total Demand	New Material Demand
COPPER, Thousand short tons	1,730	475	1,255	2,500	700	1,800	45	43
LEAD, Thousand short tons	1,212	428	784	1,950	750	1,200	61	53
ZINC, Thousand short tons	1,156	75	1,081	1,600	100	1,500	38	39
TIN, Thousand long tons	93	22	71	118	34	84	27	18
ANTIMONY, Thousand short tons	37.4	21.9	15.5	66	38	28	76	81
ALUMINUM, Thousand short tons	983	63	920	4,500	900	3,600	358	291
FINISHED STEEL, Million short tons	68			110			62	
CRUDE STEEL PRODUCTS, Million short tons	96.8			150			55	
IRON CASTINGS, Million short tons	13.5			22			62	
PIG IRON, Million short tons	65			100			54	
IRON ORE (50%), Million short tons	130			200			54	
NICKEL, Thousand short tons	100			200			100	
CHROMITE, Thousand long tons	875			1,750			100	
MOLYBDENUM, Million pounds	26			70			170	
COBALT, Million pounds	9			40			340	
TUNGSTEN, Million pounds	6			15			150	
MANGANESE ORE (46%), Thousand short tons	1,800			2,700			50	
FLUORSPAR (100%), Thousand short tons	369			1,060			187	
RUBBER, Thousand long tons	1,620	300	1,320	3,300	800	2,500	104	89
SULFUR, Thousand long tons	4,806			10,100			110	
PETROLEUM, Million barrels	2,375			5,000			110	
COAL, Million short tons	522			815			56	
NATURAL GAS, Billion cu. ft.	6,300			15,000			138	
ELECTRIC ENERGY, Billion kw.-hr.	389			1,400			260	

MAGNESIUM: Distinctly a metal of the future because of its chemical properties and light weight. Large-scale use awaits technological improvements in alloying, fabricating.

TITANIUM: Promising potentialities in high-temperature and corrosion-resistance applications. Required: Development of low-cost, continuous production processes, development of usable alloys, preventing contamination of metal when hot or molten, improvements in methods of working, drawing, casting, machining, welding.

MANGANESE: Research is needed to permit economical use of low-grade manganese and manganiferous ores, to bring about reclamation from slag, to use less of the metal in steelmaking.

NICKEL, CHROMIUM: We will have to rely on more imports of these metals. Their stockpiling must be realistic. The government should undertake a co-operative program to intensify exploration for new sources for the metals.

COLUMBIUM, TUNGSTEN: As with nickel, chromium, cobalt and manganese, sources for these two metals must be developed and expanded. They should be stockpiled; new sources should be sought. Industry would have to economize in their use during an emergency.

exploration and utilization, application of percentage depletion to many more minerals and other incentives to stimulate prospecting. The government permanently should have authority to negotiate long-term minerals procurement contracts with firm prices, and favorable tax treatment would go to U. S. corporations with foreign minerals subsidiaries.

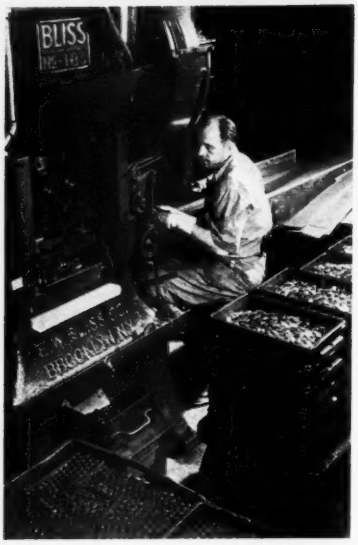
Guide to the Future—Disclaiming any crystal ball, the commission frankly admits that its estimates of 1975 metals and materials needs in the United States are likely to be found in error as time goes on. For example, the ratio of finished steel output to ingot production might improve greatly with technological progress. There is a good chance, for example, that continuous casting not only may obviate the investments in ingot molds, stripping cranes, soaking pits and blooming and slabbing mills, but would eliminate the present losses due to cropping. Then, there isn't any dependable way of estimating future requirements for defense. But projections made by the commission, taking into consideration factors that made for growth in our minerals and metals consumption in the 50 years preceding 1950, are to be considered as a safe guide.

The five volumes constituting the report are entitled: I—Foundations for Growth and Security; II—The Outlook for Key Commodities; III—The Outlook for Energy Sources; IV—The Promise of Technology; V—Selected Reports to the Commission. All may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25.

U. S. SIZE IN '75

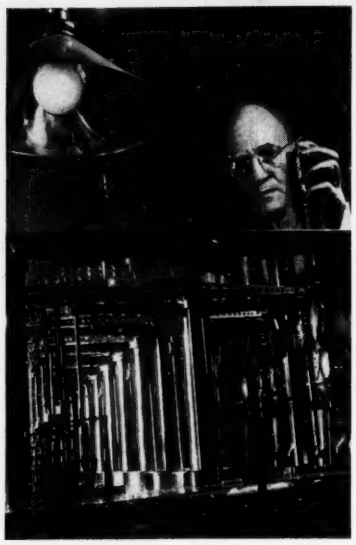
PERCENTAGE OF GROWTH FROM 1950 to 1975

Population	27
Labor Force	27
Gross national product	100
Gross private domestic investment	40
Construction (total)	30
Residential construction	15
Private nonresidential construction	50
Demand for new producers' durables	50
Demand for new consumers' durables	40
Demand for new passenger cars	15
Demand for new appliances	50
Demand for new automobiles, trucks	33 1/3
Number of dwelling units in use	50
Number of automobiles in use	75
Number of trucks in use	150
Demand for new railroad equip.	100
Demand for new agriculture mach.	0
Demand for new telephone equip.	0
Printing and publishing	75
Paints	50
Shipbuilding	0
Fast-growing uses (aircraft, plastics)	400



A Mint of Money

Money, money everywhere. That is an apt description of the mint at Philadelphia where nothing but coins is made. The nickel shortage should not bother the mint as much as it does industry, because fewer five-cent pieces than ever are being made. But dimes are in heavy demand and pennies hold their own. At left, the coins are stamped in their final size from long strips of metal. Impressions will be made on the faces later. The waste is collected and remelted for future use. At right, an inspector weighs the coins on precision balances placed in glass to eliminate atmospheric disturbances. Although made by accurate machinery, the coins may vary in width and thus weight. These scales check for overweight; others check for underweight. They are mixed so that all lots leaving the mint will be equal



Pressure on Metallurgists

ASTM told the job now is to find new materials and make present ones do more

METALLURGISTS will find themselves under greater pressure within the next five to 15 years.

They will be busy finding new materials, making present materials do bigger jobs. They will be attempting to cut down on critical metals—finding ways to use lesser amounts in the same applications, and substituting others to aid the stretch-out.

Power Needs—Metal needs in the manufactured power field alone will be great in the years ahead, according to Norman L. Mochel, manager of metallurgical engineering for Westinghouse Electric Corp. He told members of the American Society for Testing Materials, convening in New York last week for their 50th annual meeting, that there will be a need for new development, for testing, for evaluation of metals.

Mr. Mochel delivered the first Gillett Memorial Lecture, established jointly by Battelle Memorial Institute of Columbus, O., and ASTM in honor of that "grand old man of metallurgy," Horace W. Gillett.

Optimistic — The industry is much more optimistic about the date when electrical power will be generated using atomic energy as the source of heat, Mr. Mochel says.

"Technical know-how being developed in mobile power units for military purposes may make it economically possible to use atomic energy. As of now a few hundred watts of electrical power have been generated through the atom."

The Big Difference — Enormous amounts of power are available from small amounts of fissionable material. He says there is the same amount of power in one pound of fissionable material as in 2.6 million pounds of coal.

"Should the gas turbine or atomic power developments make serious inroads on the steam turbine, the material problems are apt to increase the needs and problems from a metallurgical standpoint."

Mr. Mochel also says that in the next five years the petroleum and gas industry will use about 45 per cent of all gas turbines, central station industry 35 per cent, industrial applications 15 per cent and locomotives 5 per cent.

Tin Topics—During the tin symposium early in the week, F. Stuart Miller, vice president, Pacific Tin Corp., said that world tin production for the last four years exceeded consumption of primary tin by 27,000 tons per year. He said the excess has been available for stockpiling. At present it looks like there may be a surplus, but political factors seriously threaten tin production. There's plenty of tin to meet requirements, he asserted, if political conditions allow it to be mined.

Homer C. Pratt, project engineer, Fisher Body Division of General Motors, told the symposium that the auto industry reduced its use of critical tin for soldering of car bodies from one pound to 0.18 pound per body through low-tin filler materials and development of new methods of tinning.

Officers — New president of ASTM is Dr. Harold Lee Maxwell, supervisor of mechanical engineering consultants, E. I. duPont de Nemours & Co. Inc., Wilmington, Del. Norman L. Mochel, manager, metallurgical engineering, Westinghouse Electric Corp., Philadelphia, is the new vice president.

Texas Plant To Start Aug. 1

Sheffield Steel Corp. will begin operations at its new iron ore beneficiation plant at Rusk, Tex., on an experimental basis about Aug. 1. Plans to build a second blast furnace at Houston have been tabled because of "uncertainties that now exist."

Sheffield plans to double its ore mining facilities in both Cherokee and Cass counties, Tex. The company wants to reconstruct, modernize and enlarge the wartime operations at Jacksonville and Linden.

Steel Strapping: Feeling the Pinch

Shortage of steel strapping could put a crimp in many shipments otherwise unaffected by the steel strike. But steel makers, the strappers' top customer, aren't buying

STEEL STRAPPING makers are feeling the steel strike in a unique way—their source of supply and major source of demand are both squeezed.

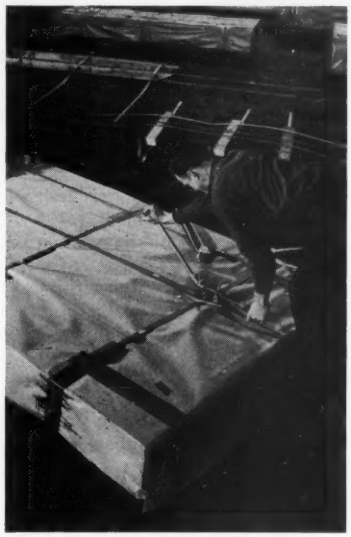
The steel industry, consumer of 38 per cent of their total output, doesn't need strapping right now. That takes the pinch off demand on the heavy end of the ledger for the less-than-a-dozen firms which comprise the steel strapping industry. Of their 100,000 customers, 80,000 use less than 20 per cent of the total output. These occasional users shouldn't feel the strike greatly either.

In the Middle?—But moderately heavy users of strapping like railroads, paper, lumber, textiles and nonferrous metals will feel the pinch if the steel strike is prolonged. An NPA order limits their inventories to 45 days and many now have less than 30 days' supply on hand. While inventories of strapping are adequate to meet normal demand, they aren't being replenished at the usual rate and a shortage could develop.

Government contracts in many cases specify steel-strapped packaging. Ordnance and quartermaster items such as shells, rations, replacement parts and clothing could be delayed by a shortage of strapping. So a long range situation shapes up implying that products that don't become short because of a lack of steel for components could become short because of the lack of steel strapping to ship them.

Key Ties—The handful of firms in the industry consumed over 400,000 tons of low carbon steel in 1951 and figured to consume 450,000 tons in 1952 until the steel strike nipped their output. Increases have been shared among existent firms, most of whom are subsidiaries of large steel companies.

New developments and applications keep appearing in the strapping industry. Palletizing, strapping products to a pallet for shipment after which the pallet is discarded or returned, has found increased use during and since World War II. New corrosion-resistant and lubricating coatings are being developed for bands. And one firm, Signode Steel Strapping Co., Chicago, is supplying an automatic banding machine. You don't buy the tools to band packages—you just rent them for a flat yearly amount from the firm that makes the strapping.



STRAPPING-SQUEEZED STEEL

. . . now steel squeezes strapping

Write-Offs Total $4.4 Billion

The iron and steel industry received accelerated tax amortization certificates covering $4.4 billion of total expansion costs from DPA since the start of the present national emergency, says the American Iron & Steel Institute.

On the total of certificates of necessity approved for all industry, five-year amortization was allowed on 58.8 per cent of the total cost. Steel works and rolling mills received 61 per cent in five-year amortization on over $2.5 billion in proposed expansion. Blast furnace expansion received 71.4 per cent of $651 million in expansion, while iron ore companies were permitted 70 per cent in write-offs on $708 million in projects.

More Steel Expansion Approved

After two years of fighting in Korea expansion of defense facilities continues at a fast pace. For the two weeks ended June 5 certificates of necessity for accelerated tax amortization of 507 new or expanded defense facilities, amounting to $382,925,179, were approved by Defense Production Administration. More than 72 per cent of the dollar volume represented 42 large projects, including: Railway transportation, over $102 million; steel industry facilities, over $126 million; power projects, about $39 million; and aircraft, over $8 million.

Certificates issued to the steel industry included: United States Steel Co., between Port Ordaz, Venezuela, and United States ports, transportation of iron ore, $99 million; National Steel Corp., Steamship Division, water transportation, $6 million.

Bethlehem Steel Co., Sparrows Point, Md., steel production, $6,532,000; Cambria county, Pennsylvania, steel production, $3,617,000; Northampton county, Pennsylvania, steel production, $2,956,000.

Carpenter Steel Co., Reading, Pa., stainless steel for military end items, $2,859,540; and Wheeling Steel Corp., Follansbee, W. Va., coke, $5,210,500.

More Coke Expansion

Defense Solid Fuels Administration has certified for fast amortization seventeen slot-type coke oven plants and/or coal and coke chemical facilities for total outlay of $100,483,996. They are for Tennessee Coal, Iron & Railroad Division of U. S. Steel Co. and Sloss-Sheffield Steel & Iron Co., Birmingham; Alabama By-Products Corp., Tarrant, Ala.; Yolo Steel & Metal Co., Sacramento, Calif.; U. S. Steel, Gary, Ind.; North American Steel Corp., Clinton, Ia.; Bethlehem Steel Co., Sparrows Point, Md.; Eastern Gas & Fuel Associates, Everett, Mass.; American Steel & Wire Division of U. S. Steel at Duluth, and Cleveland; In-

terlake Iron Co. at Erie and Toledo; Allied Chemical & Dye Corp., Ironton, O.; U. S. Steel, Clairton, Pa.; and Central Iron and Steel Co., Harrisburg and Phoenixville.

Percentage certification on those facilities varies from 40 to 90 per cent. Counting this latest action, DSFA has now approved 84 coal and related projects for fast write-offs costing $318,500,000. These new facilities when completed will produce about 12 million tons of coal and 6,640,000 tons of coke.

NPA Seeks Castings Data

How much capacity is there in the country for production of steel castings—particularly heavy castings? National Production Authority hopes to be in better position to determine this figure in the future.

NPA plans to issue Direction 14 which will authorize allocation of steel castings over a period of seven months. Under this direction castings allocations, starting with the fourth quarter of 1952, would stretch through the period ending June 30, 1954, with succeeding quarters opened for allocations as time goes by. Under this system, foundries could book orders with firm promises of delivery dates, and they would be better able than at present to specify open spots in their production schedules. Out of experience gained under this direction, NPA hopes to be able to estimate the industry's capacity.

Castings Specifications Issued

Blueprints and specifications are available at Wright-Patterson Air Base, Dayton, O., to foundrymen interested in producing steel castings for the 17,800 to 50,000-ton presses in the Air Force program (see STEEL, Apr. 7, p. 87 and June 23, p. 45). They will be on view in the office of Col. W. R. Carter, chairman, Heavy Press Committee. About 200 castings, ranging in weight from 1275 lb to 353,000 lb with the majority closer to the upper limit, are required.

Actual procurement orders will be placed by the contractors: Loewy Construction Co., Baldwin-Lima-Hamilton Corp. and Lombard Mfg. Co.

Industrial Lighting: Outlook Bright

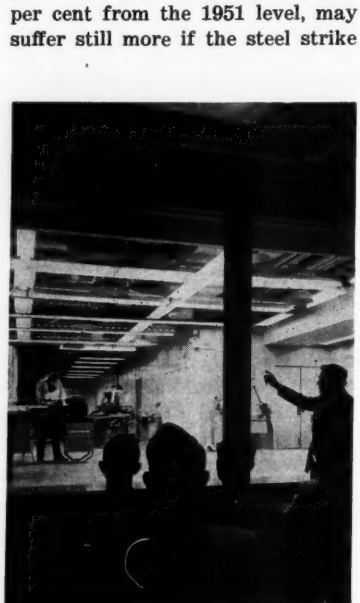
Light-conscious industry has kept fixture makers busy. Sales this year are off 20 per cent from the peak in 1951 but lighters see a steady demand ahead

LET THERE be light is the theme of industry today, and it's music to the ears of fixture makers. Before the war, progressive plants had a general illumination level of 10-15 footcandles. Now the level in progressive plants is raised to 30-50 footcandles.

There's a good reason: Better lighting has paid off in production increases up to 34 per cent in some types of operation, cut rejects up to 50 per cent. Most plants are convinced they hiked production five to ten per cent when they modernized their lighting equipment.

No Hiding — Fixture makers aren't hiding their lights under a bushel and the word is getting around. Most are ready to confirm management's worst fears with their light meters free of charge and advise utilization of their products.

The couple-of-hundred firms making industrial fixtures and lamps hung $61 million-worth of their products in plants during 1951, one of their best years. This year sales are down about 20 to 25 per cent from the 1951 level, may suffer still more if the steel strike continues. But currently there is plenty of equipment available.



DEMONSTRATION LIGHTING
. . . one factor in growth

De-lighting?—Significance of the drop may be that modernization programs are over their peak. New plants are currently leading in number of units purchased with aircraft makers spending the most in recent months.

Another explanation may be that lowered production schedules in many plants are making management cost conscious. Cost to revamp lighting in a 100,000 square foot plant doing light assembly with fluorescent fixtures could run from $2500 to $35,000 depending on the type and number of fixtures desired and the physical characteristics of the plant. That could deter management from adding the efficiency-bonus five to ten per cent to the already surplus production of their plants.

Light Ahead—But the fixture makers aren't worried. The incandescent fixture makers see a trend back to their product due to high maintenance cost of fluorescent units. The fluorescent fixture makers see a growing trend toward their product because the light is softer, the current drain less.

But the electric companies are all smiles—industry is light conscious.

Canada Continues To Grow

Canada, the "newest industrial power" (STEEL, May 19, p. 63), added 95 foreign-owned plants to its growing list with inquiries indicating many more additions in the future. U. S. firms built 50.

Inquiries by mail in 1951 regarding the establishment of branch plants in that country amounted to 425, says the Department of Trade and Commerce. They came from 37 countries. Over 500 individuals made official visits to Canada to investigate expansion possibilities. The tempo of such activities has been increasing this year, especially since the first of last month.

High Altitude Living

PULSE—Steady.
RESPIRATION—Excellent.
BLOOD PRESSURE—A point too high.
WEIGHT—A few pounds over.

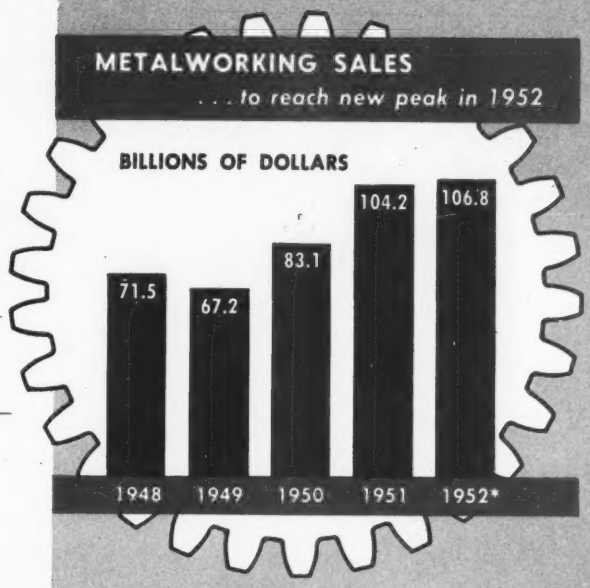
THERE you have STEEL'S semiannual diagnosis of business as industry reaches the halfway point in a hectic 1952. Despite tumult of war and controls, the business pulse beats steadily, denoting good fundamental health. Although metalworking sales this year will climb still further to a heady peak of $106.8 billion, industry still has plenty of wind. Several years of high living and exasperation over the steel strike have combined to push the business blood pressure up a little. But a remedy for that is a new fitness program shaping up for the next six months in the form of a return to strong competitive conditions to meet a buyers' market.

Stimulants to the economy over the next half are numerous, but these three stand out: Defense spending, expected expenditures for new plant and equipment and construction outlays. Defense spending may total $51 billion this year, a far more potent pill than the $30.3 billion spent for war in 1951 (see the chart). Outlays rose rapidly in the last six months—at an annual rate of $46 billion for the first quarter, to a rate of $49.5 billion in May and still higher in June. The annual rate for the next six months will approach $53 billion.

New plant and equipment expenditures planned by business this year will rise to a record $24.1 billion (see the chart on the third page). That's above the 1951 level both in dollars and physical volume. Expenditures for new construction—private and public—will reach $32 billion in 1952, again higher in dollars and physical volume than in 1951.

Those will combine to push metalworking sales this year to a new height above last year in both dollars and physical volume (see the chart). First

METALWORKING SALES
. . . to reach new peak in 1952



BILLIONS OF DOLLARS

	1952*	1951	1950	1949	1948
Total Metalworking	106.8	104.2	83.1	67.2	71.5
Primary Metal Products	23.0	23.4	19.6	14.8	17.2
Fabricated Metal Products	13.5	13.4	11.6	9.2	10.2
Machinery (Except Elec.)	23.1	21.6	16.0	14.1	15.7
Electrical Mach., Equip.	13.0	12.6	10.9	8.4	8.9
Transportation Equipment	25.3	25.4	22.7	18.9	17.5
Instruments	2.9	2.8	2.3	1.8	2.0
Ordnance†	6.0	5.0	—	—	—

* Estimated by STEEL.
† Ordnance production in government plants is undocumented, so here estimated by STEEL. Such output before 1950 was negligible.

DEFENSE SPENDING
. . . slips into higher gear

Source: Department of Commerce

half sales reached $53.4 billion, and the second half should duplicate the first six months' performance. Bulk of the metalworking sales losses due to the steel strike will be felt over the rest of the year, but defense spending will be higher. Whether by accident or design, the government's intervention in the steel wage case has acted to "firm" the economy because the federal moves have slowed settlement and the three walkouts partly resulting from that slowness have cost us steel at just the time when steel markets were softening.

Health Factors

Economists are now betting that even the heady effect of a steel price increase won't set the inflationary spiral twirling too far. Manufacturers who use steel in their products will hesitate to pass on to the consumer the total increased steel cost for fear of buyers' resistance. Hence, the price level, as per the consumers' price index at the bottom of this page, will remain nearly steady for the rest of the year, and that should be a big help to business. The index average for the year will be about 1.6 per cent over 1951. Most of the rise occurred in the first quarter; then the price gage flattened out.

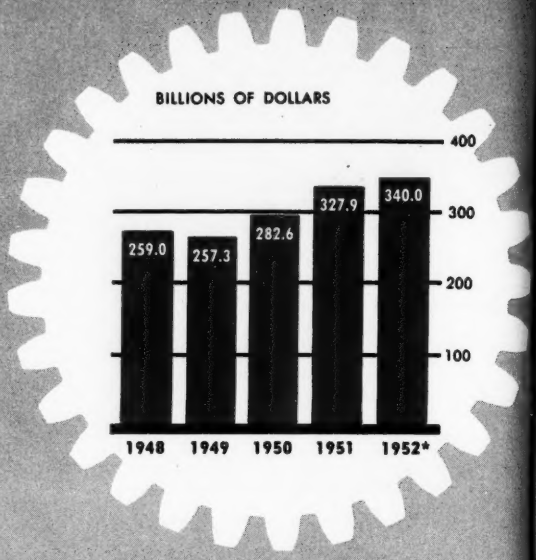
Another factor contributing to business health for the next six months is the improving materials situation. Less than two weeks ago, 100 million more pounds of copper were made available for the third quarter, to come chiefly from South America. Only three months ago, copper loomed as one of the major bottlenecks in defense production. Aluminum capacity has been increasing steadily, and that metal has never caused serious trouble. An indication of the greater availability of both those metals lies in the sweeping relaxation of controls on both to permit self-certification by some 25,000 users who formerly had to apply to NPA for allocations.

Although the steel strike loss in tonnage is serious, it's not catastrophic. We were close to a balance between supply and demand two months ago. There'll be some tightening of the belts now, but we'll again be near balance in the metal by a year from now at the latest. Estimated demand for steel this year is between 105 and 110 million ingot tons (see the chart). Without the steel strikes, our added capacity—a scheduled 118 million tons by the end of the year—would probably have permitted production of 110 to 115 million tons—more than enough to meet requirements. This year our mills won't be able quite to meet demand, but the gap will be narrow. Nickel remains the problem child among metals, but even here relief is in sight as a result of planned added capacity in the U.S., but it won't help much this year.

While the rapid rise in defense spending for the next half would appear to mean a corresponding increase in the use of materials, dollar spending will actually climb faster than materials requirements. That's because the climax in the tooling period of rearmament and the resulting heavy demand for materials is past.

Another aid to the body economic is the passing of controls. They all won't disappear this year (steel

GROSS NATIONAL PRODUCT
. . . not rising quite so fast



Source: Department of Commerce
*Estimated by STEEL; first quarter annual rate was $339.7 billion.

INDUSTRIAL PRODUCTION INDEX

MONTHLY AVERAGES

1948	192
1949	176
1950	200
1951	220
1952*	221

Source: Federal Reserve Board

PERSONAL INCOME

BILLIONS

1948	$209.5
1949	$205.1
1950	$224.7
1951	$251.2
1952*	$258.0

Source: Department of Commerce

CONSUMER PRICE INDEX
(1935-1939—100)

MONTHLY AVERAGES

1948	171.9
1949	170.2
1950	171.9
1951	185.6
1952*	188.5

Source: Department of Labor

CONSTRUCTION
(All Types)

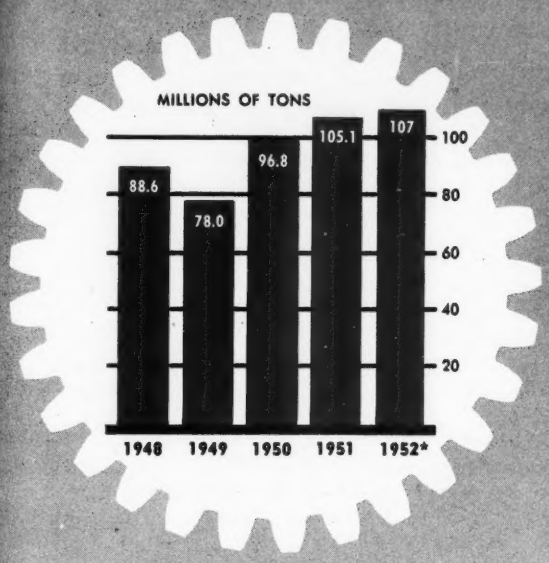
BILLIONS

1948	$21.6
1949	$22.3
1950	$27.9
1951	$31.0
1952*	$32.2

Source: Department of Commerce

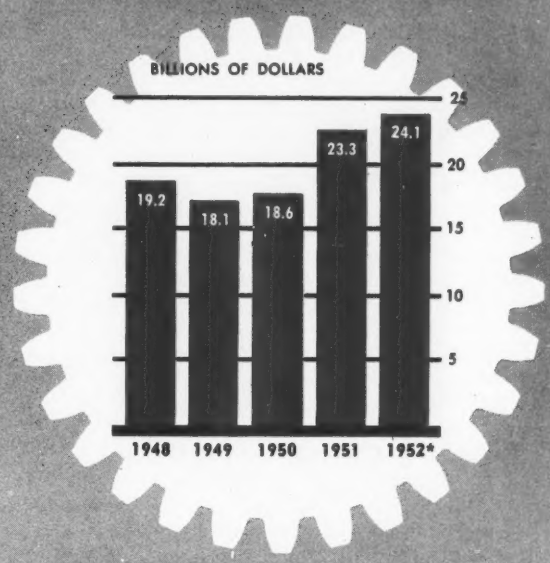
*Estimated by STEEL

STEEL INGOT PRODUCTION
. . . record possible despite strikes



Source: American Iron & Steel Institute
*Estimated by STEEL

NEW PLANTS & EQUIPMENT
. . . spending reflects defense buildup



Source: Department of Commerce and Securities & Exchange Commission
*Estimated by STEEL

curbs may even have to be tightened for a while), but they're on the way out, unless we have a full-dress World War III. In that event, all economic estimates blow up with the atomic bomb.

The peak in consumer demand is supposed to be past, but the buying public is still showing surprising eagerness for some metalworking products, notably housing and the newer appliances such as dryers, dishwashers and freezers. That development will continue for the rest of the year to contribute to the economic health. Consumer spending is encouraged partly by the growth in population. In the past 12 months alone, 2.7 million more people have joined the ranks as customers.

A factor that could work either as a stimulant or depressant on the economy for the next six months is consumer income and saving. A glance at the table at left shows the consumer income should hit an alltime high this year. The catch is that the consumers aren't anxious to spend their money either. The postwar average of income-saving after taxes is about 5 per cent, but it has been up as high as 9 per cent thus far this year and will probably average 7 over the 12 months.

To the definite detriment of the economic health for the next half and probably for some time after that is high taxes. And 1952 is the first year we will feel the full impact of the higher taxes passed since the Korean war began. Even government tax experts now believe that the optimum point has been reached in the income tax. They're toying with the idea of a general federal sales tax.

Another danger point in the economy's physique is the indication that we'll soon begin to level off in capital equipment expenditures despite record outlays this year. The government is limiting further industrial expansion. In the all-important machine tool field, backlogs stood at 21 months on the average three months ago They're dropped to half that now.

The slight decline could be caused by a shift in defense spending, and some of the metalworking executives, economists and bankers interviewed point out that too much of the economy now depends on the benzedrine of defense spending, with benzedrine after-effects when the stimulant wears off.

Plusses and Minuses

But the plusses out-balance the minuses on the economic health chart at midyear. The gross national product (economists' term for the dollars you and everyone else in the U.S. get for goods and services) goes up to about $340 billion in 1952, compared with $327.9 billion last year (see the chart). The Federal Reserve Board's industrial production index, shown in the accompanying table, will average only about 221 for 1952, less than half of 1 per cent over the 1951 level. It will decline in July because of steel strike effects and rise thereafter, to hit a high of about 225 late in the year. The index, which works well in peacetime, does not reflect some military ordnance activity and is probably low for actual operations in this rearmament economy.

The net result on the economic system of all the plusses and minuses is still good health, but health

of a different type than we've had in the past two years. We're in a buyers' market for the next half. You can get nearly any kind of appliance now under the list price. Trade-ins on your old automobiles are good. Purchasing agents note increasing competition among makers of hundreds of industrial components. A decision many a manufacturer will have to make in the coming half year is whether to cut his prices or hold the line but build a better or fancier product for the same money. Delivery dates will loom larger from now on in influencing sales.

The mild slump now going on in many consumer durables and even in some producer goods is an indication of the change to a buyers' market. The shift has taken the form of an inventory adjustment, and the manufacturers are now forced to carry the stocks that ever since the beginning of the Korean war distributors and jobbers have had to carry.

Generally, most metal-consuming plants in the U.S. will do slightly better in 1952 than in 1951 and about the same in the second half as in the first. Not all segments of metalworking will fare exactly the same way.

Industry-by-Industry Diagnosis

AUTOS—About 4.8 million cars and 1.4 million trucks will be turned out in the U.S. and Canada this year (see the table). Of those totals, 4.5 million cars and 1.2 million trucks will be assembled in U.S. plants. Although the totals are under the 1950 and 1951 performances, they're still among the highest of the postwar period. Cars can be sold now, but it takes more work than at any time since early 1950. Many makers hoped that a model changeover early this fall would spur their sales, but the steel strike has delayed many of the plans to switch, and the 1953 cars probably now won't be ready until later in the fall. Medium and heavy trucks are hard to sell. The next half could see greater emphasis by many manufacturers on lighter vehicles.

CONSTRUCTION—The $32 billion construction outlays now expected for 1952 are the surprise of the year. And the most surprising performance in the construction category is in residential housing. Between 1 million and 1.1 million will be built this year, despite predictions earlier that only 850,000 would push their roofs toward the sky. The $11 billion outlay in public construction accounts for 34 per cent of the total $32 billion expected to be spent on new construction this year.

RAILROADS—Financing problems will hold back new equipment buying for the rest of the year, just as it has thus far in 1952.

SHIPBUILDING—Nothing spectacular, although the established shipyards of the country are all moderately busy. Oil tankers for ocean travel and barges for inland waterways are filling out the order backlogs nicely. Defense work directly for the Navy or Army is spotty.

AIRCRAFT—The sky—and perhaps even beyond that—is the limit here. About 1250 planes a month will be delivered by the end of 1952. The anticipated peak in deliveries will come sometime in 1954. By mid-1953 will come the peak in backlogs, about $24 billion. They'll level off to $9 billion in 1955. Now, new orders are far ahead of expenditures, one of the few areas in defense spending where this is still the case. From mid-1950 until mid-1957, the government will have spent $70 billion for aircraft and related items.

OIL AND GAS EQUIPMENT—Peak or near-peak production for the rest of the year.

MINING, Quarrying and Lumbering Equipment—A moderate decline here for the rest of the year, largely because of faltering demand from coal mine operators, the biggest buyers.

MACHINERY, Except Electrical—To-the-limit production of all types of specially designed equipment will be offset by a slight but noticeable drop in requirements for standard items, even in machine tools. Manufacturers are looking seriously to foreign markets, but federal regulations and foreign competitors make prospects there gloomy. A pick-up in textiles, leather and other soft goods expected in the next half may mean orders for machinery in those lines.

ELECTRICAL EQUIPMENT—Expect production to the limit on practically all items in this category. Especially busy will be makers of electronic and utility apparatus.

APPLIANCES—Except for room air conditioners, dishwashers, freezers and a few other relative newcomers, most appliance sales will be sluggish for the rest of the year.

FARM MACHINERY—The same situation as in appliances.

CONTAINERS—Production will be good, but no records will be set.

ORDNANCE—At least a 20 per cent increase over 1951 should occur in 1952.

The health of the economy is good, despite a few danger spots. How does a diagnosis of your company compare with industry's generally? With the tonic of increased competition now available, you have the chance to tone up your patient to surpass the average fitness levels.

AUTO AND TRUCK PRODUCTION
. . . still high despite shortages

(U. S. and Canada)

	CARS	TRUCKS	TOTAL
1948	4,078,009	1,465,291	5,543,300
1949	5,319,086	1,230,093	6,549,149
1950	6,954,417	1,449,650	8,404,067
1951	5,619,540	1,536,879	7,156,419
1952*	4,800,000	1,400,000	6,200,000

Source: Ward's Automotive Reports. * Estimated by STEEL.

Unveiled: Shell Molding

Cooper Alloy Foundry shows its progress in a plea to end secrecy surrounding developments

COOPER Alloy Foundry Co., Hillside, N. J., is taking the wraps off its developments in shell molding and casting stainless steel.

The shell mold process, which derives its name from the fact that molten metal is poured into thin, plastic-bonded shells rather than into heavy sand molds, has been under study ever since May, 1947, when a government report described generally an experimental process attempted by the Germans during World War II.

Unveiled — Since 1947, much secrecy has surrounded American developments in the shell mold process. Cooper's public demonstration of its progress was made in hope that much research and development work going on won't be duplicated and the benefits of the process realized more quickly.

Cooper's shell mold machine was built by Shell Mold Machine Co., College Point, L. I., and delivered to Cooper last December. The company started out making globe valve bodies. At the first there were high losses, but now the bugs have been worked out and Cooper is in production. It also makes afterburners for Pratt & Whitney jets which are difficult production pieces. It makes a 1-inch, 90-degree elbow, and plans to turn out a milk funnel for American Can Co. and a ring for General Electric Co.'s garbage disposal unit.

Opportunity—Cooper sees great things for shell molding. It's easily applicable to mechanization. It requires less skill on the part of molders. The company finds that aluminum patterns are satisfactory because of ease of handling and no trouble with the mix affecting the pattern. Cooper finds that heats of 1500 and 2000 pounds work out well.

Although prospects look good, some problems still must be solved. The aluminum patterns are expensive, resin costs are high. Shell molds tend to swell or expand. Finally, the secrecy surrounding American developments of the process, Cooper believes, has hampered progress.

Key to World-Wide Radio

Westinghouse Electric Corp. is building at its Huntington Park, Calif., plant $2 million worth of radio transmitters for a world-wide Air Force radio network. The keyer, shown being assembled, permits sending signals by telegraph key up to 7000 miles away at 500 words a minute. The sets also are equipped for voice communication

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

COPPER RAW MATERIALS—Amendment of June 19, 1952, of NPA Order M-16 is to insure an equitable distribution of domestic and foreign refined copper. The new distribution method provides a separate monthly allocation of domestic refined copper to brass and wire mills, foundries, ingot makers and miscellaneous producers. The amendment was effective June 19.

LABORATORIES—Amendment of June 19, 1952, of NPA Order M-71 is to enable scientific and technical laboratories to expedite their defense work. Most important of the changes permits laboratories having defense contracts to extend ratings bearing military or atomic energy symbols for material and parts needed to fulfill these contracts. The amendment was effective June 19.

COLOR TELEVISION—Amendment of June 24, 1952, to NPA Order M-90 permits manufacture of color television sets for theaters and other commercial purposes. It allows production of home-type sets only with permission of NPA. The amendment was effective June 24.

Appointments in Washington

Milton C. Sarran, manager of the warehouse division of Atlantic Steel Co., Atlanta, was named chief, Warehouse Branch, Iron & Steel Division, Office of Price Stabilization.

William P. Walker, Glenn L. Martin Co., Baltimore, was appointed acting chief, Aircraft Section, Automotive Branch, Industrial Materials & Manufactured Goods Division, Office of Price Stabilization.

Thomas J. O'Neil, on leave from Ford Motor Co., Dearborn, Mich., joined the Motor Vehicle Division, National Production Authority.

Martin Kelso Elliott and Anthony Franklin Arpaia were nominated as members of the Interstate Commerce Commission to succeed, respectively, John L. Rogers and Clyde B. Aitchison, retired.

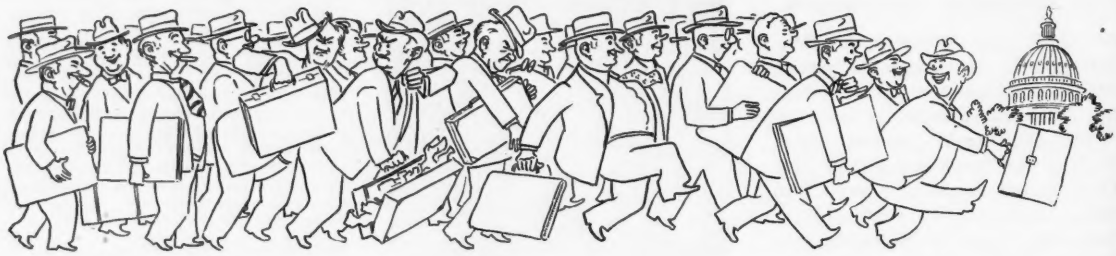
Metals Branch, Industrial & Manufactured Goods Division, Office of Price Stabilization, was split into two units: The Iron & Steel Branch and the Nonferrous Metals Branch. William Kerber, on leave from Hanna Furnace Corp., Detroit, was named chief of the Iron & Steel Branch. Charles C. Reith, former chief of the Tin, Lead & Zinc Section, Metals Branch, is now chief, Nonferrous Metals Branch.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $250,000

PRODUCT	CONTRACTOR
Milling Machines	Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.
Lathes, Engine	Lodge & Shipley Co., Cincinnati
Tractors, Fork-Lift	Clark Equipment Co., Buchanan, Mich.
	Minneapolis-Moline Co., Minneapolis
Trailers, Warehouse	Standard Mfg. Co. Inc., Mt. Airy, N. C.
	Fan-Weld Corp., Philadelphia
Motor Vehicle Parts	Oshkosh Motor Truck Inc., Oshkosh, Wis.
Trucks	International Harvester Co., Chicago
Gun, 90 mm	Chrysler Corp., Detroit
Mortars, 81 mm	A. B. Farquhar Co., York, Pa.
Shells, 81 mm	Rheem Mfg. Co., New York
Shells, 60 mm	Line Material Co., Milwaukee
Shells, 155 mm	Oliver Corp., Chicago
Fuzes	General Time Corp., New York
Cartridge Cases	Rheem Mfg. Co., New York
Metal Parts for Fuzes	Regina Corp., Rahway, N. J.
Director Parts	Western Electric Co., New York
Radio Sets	Admiral Corp., Chicago
Teletypewriter Sets	National Cash Register Co., Dayton, O.
	Teletype Corp., Chicago
Electron Tubes	Sylvania Electric Products Inc., New York
Tube Testers	Hewlett & Packard Co., Palo Alto, Calif.
Cranes, Diesel-Electric	American Hoist & Derrick Co., St. Paul
Pumps, Fuel	De Laval Steam Turbine Co., Trenton, N. J.
Motor Generators	General Electric Co., Schenectady, N. Y.
Generator Sets	West Coast Engine & Equipment Co., Berkeley, Calif.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



Aggressive firms are coming to Washington to tap Uncle Sam, their big customer . . . Concentrated union power gets NLRB cold shoulder . . . Government drops rubber business

THE WASHINGTON magnet draws more industry representatives. Manufacturers, attracted by the buying climate in the nation's capital, are bringing in elaborate exhibits of their products for display in hotels. More trade associations are moving in.

Exhibitors hope to educate government procurement officials and others who have a hand in shaping military contracts but do not usually attend the national expositions. Object of the displays: To get more government business with its concommitant supply of strategic materials.

Exhibits were just held in Washington by the Acme Steel Co., Chicago; Joseph Mazia, Washington representative of American Chemical Paint Co., Ambler, Pa.; Stoner-Mudge Co. Inc., Pittsburgh; and Orchard Brothers Inc., of Rutherford, N. J.

Industry associations are going whole hog and moving their offices to the capital. Latest to make the move was the Industrial Truck Association. That makes Washington the headquarters city for over 250 industrial and trade associations with a number of others contemplating the move shortly. Basis of the moves: The federal government is the largest customer of many industries, and companies with defense contracts get first whack at strategic materials.

Many association managers find they are spending most of their time in Washington anyway and figure the move will pay off.

Labor Board: About Face? . . .

The National Labor Relations Board has about-faced from its policy of encouraging concentration of union power if its decision in the Continental Baking Co. case represents its present thinking. The board denied the petition of the Bakery and Confectionery Workers International Union-AFL to establish a nation-wide bargaining unit of all employees in the company's 83 bakeries in 65 cities throughout the country. The board decided against this proposal because of the long history of collective bargaining on a local area, multi-employer basis; the local autonomy of the branch plants; and local nature of baking business.

Federal Rubber: Snaps Back . . .

The Rubber Act extension bill sent to the White House June 16 for the President's signature, reflects the growing congressional disposition to prevent further encroachment by the federal government into competition with private business. It requires the President to recommend to Congress by Apr. 15, 1953, legislation aimed at disposal of rubber-producing facilities to private industry.

Single Catalogue: Closer . . .

The Federal Catalog bill, H. R. 7405, which would instruct the Department of Defense to develop a single catalog to replace the many now used by different government procurement agencies, has been reported by the House Committee on Armed Services for action.

Apprentices: Deferrals Soon . . .

Employers with training programs will soon be able to obtain from their local draft boards deferrals of their apprentices from induction into the armed services under the Selective Service Act. Regulations similar to those granting deferrals to college students are in process of being written.

Alloy: Appreciated . . .

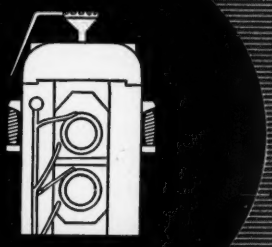
Dr. John Wesley Marden, research scientist, Westinghouse Electric Corp., has received from Secretary of the Army Frank Pace Jr. a Certificate of Appreciation for his development of a new alloy for barrel liners of automatic weapons. His discovery has made possible design of machine guns and other weapons with greater performance characteristics.

"B" Products Guide . . .

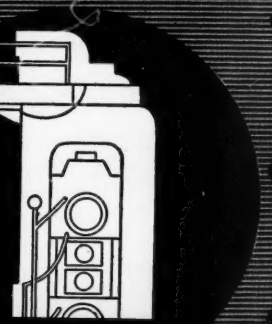
Producers of "B products"—items of civilian or mixed military and civilian application—will be interested in the latest Renegotiation Board publications. Designated Bulletins No. 3 and 3A, the former classifies CMP symbols as indicating that a sale is "renegotiable," "non-renegotiable" and "possibly renegotiable." The latter, prepared for those in the "possibly renegotiable" class, offers guidance in segregating B products for purposes of renegotiation based on classification for fourth quarter, 1951.

Price of the Renegotiation Board regulations is $1.50 a year, including all regulations to date.

MORGOIL
ROLL NECK BEARINGS



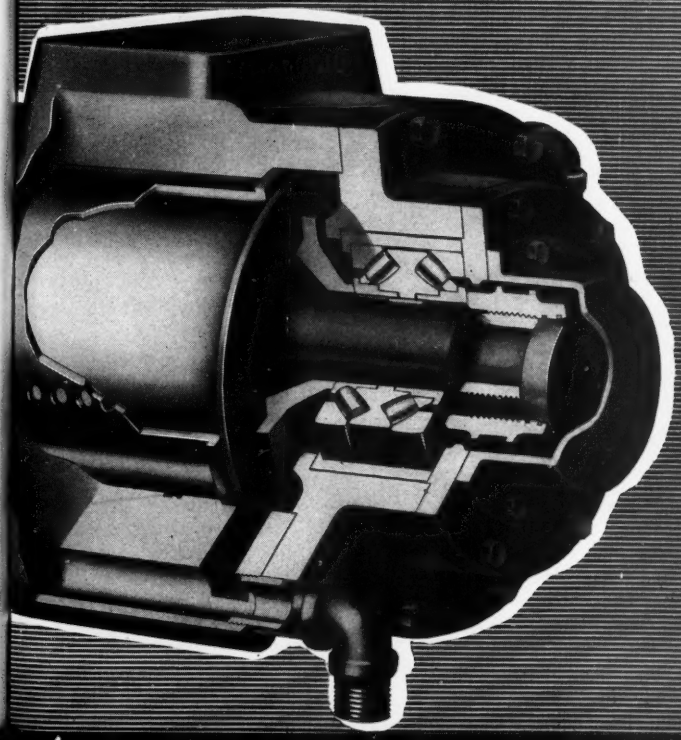
2-HIGH



4-HIGH

Aluminum Alloy bushings have been tested in MORGOIL Bearings on all types of 2-high and 4-high mills, in the plants of many of our customers and have definitely proven their superiority under the most grueling of operating conditions . . . . .

They are now supplied as standard equipment.



MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

ROLLING MILLS - MORGOIL BEARINGS
WIRE MILLS - GAS PRODUCERS - AIR EJECTORS
REGENERATIVE FURNACE CONTROL

English Representative International Construction Company, Ltd.
56 Kingsway, London, W.C. 2, England

MB-21

He's right! . . . Miss Pennington

. . . **right** . . . according to the deficit spending carried out in our present day economy. Only a *"wheel deal"* politician can take **two dollars** from **your** pocket and **two dollars** from **my** pocket and get **five dollars to spend.**

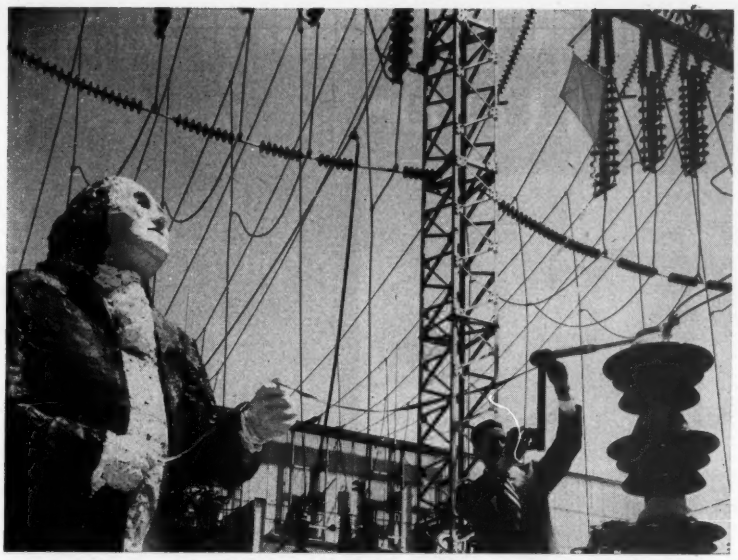
If you agree that the little student in yesterday's schoolhouse was wrong . . . where are the Miss Penningtons of today who can put us back on the right track? It was **red-brick-schoolhouse arithmetic** that made our country strong and great . . . it was the Miss Penningtons who cast their ballots for the proper **adding of facts** . . . and it's going to take sound thinking Americans in the voting booths to make **two** and **two equal four once again.**

652-CH

*Cold Wrought Metal Fasteners by

Chandler Products Corp.

1491 CHARDON ROAD • CLEVELAND 17, OHIO



In the high-voltage yard at the new GE Switchgear Development Lab, a 2½-ton, 12½-foot Benjamin Franklin sees the progress electricity has made in 200 years

GE Opens Switchgear Development Lab

TWO-HUNDRED YEARS after Benjamin Franklin made his historic kite experiment in Philadelphia, General Electric Co. opened its new Switchgear Development Laboratory in the same city. Capable of producing short circuits of 5.25 million kva, the laboratory will be used in developing, designing and testing circuit breakers and other power equipment used in large power systems.

Objectives — Costing over $10 million, the facility consists of a control building, a test building and a high-voltage yard. Robert F. Tinnerholm, general manager of the GE Switchgear Department, said that the "high-power factfinder" has four engineering objectives:

1. To develop circuit interrupters of higher ratings made necessary by rapid growth and interconnection of electric utility systems.
2. To speed the development of switchgear equipment of all types.
3. To study the effects of voltage, current, frequency, overvoltage, recovery voltage, arcing time, reclosing time, light current, capacitance current, out-of-phase condition, electromagnetic effect, temperature, repetitive switching duty and other conditions affecting switchgear equipment.
4. To reduce cost factors through investigation and a more complete understanding of arc phenomena and mechanical design.

More Capacity — GE built its first high-capacity switchgear testing and development lab in 1921 and increased its capacity in 1928. The new equipment has almost ten times the capacity of the original. It has been in the planning phase since the late 1930s, being interrupted by World War II.

Power is supplied by two generators. Operated in parallel, they can deliver 5.25 million kva asymmetrical or 3.2 million kva symmetrical at 15.5 kv, three phase. Five individual test cells, located in the control center, can test up to and including 15.5 kv. Short-circuit current as high as 500,000 amperes at 600 volts can be provided one of the cells through a bank of three 24,000 kva, single-phase transformers. Tests in this cell can be conducted at voltages ranging from 120 to 1200 volts.

Automatic Recording—Magnetic and cathode-ray oscillographs connected into test circuits automatically record electrical phenomena taking place in the equipment being tested. Films of experiments can be developed and ready for study by engineers two minutes after the test.

Four New Pools Authorized

Four new production pools will handle defense contracts and subcontracts. This brings the nation's total to 15 production pools authorized by DPA since the start of the present national emergency.

The four pools are: The Metal Products Co. Production Pool, Nashville, Tenn.; Consoliated Industries Defense Production Pool, New York; Engravers Production Pool, New York; and Woodworking Defense Production Pool, New York.

DTA Approves 424 Projects

Defense Transport Administration approved 424 projects for construction of surface transportation, warehousing and storage and port utilization facilities for third quarter. DTA approval authorizes allotment of controlled materials.

Total value of the projects is about $458.2 million. Largest authorization was for $44.8 million for modernization of power supply for New York City street railways and subways.

Latin America Expands Output

Latin American plants turned out a record total of more than 1.6 million tons steel in 1951, estimates the American Iron & Steel Institute. This output will be nearly doubled if present steel expansion is completed.

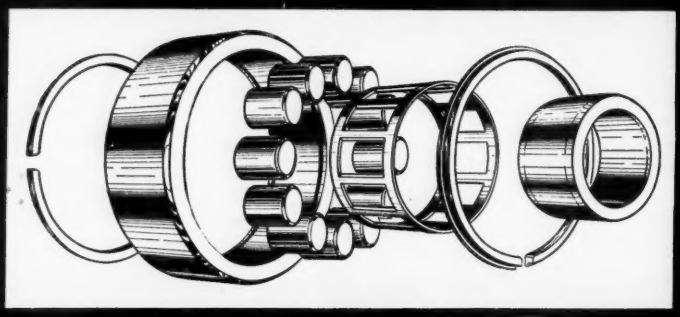
Of the seven Latin American countries with steelmaking furnaces, Brazil is by far the largest producer—with 900,000 tons ingots in 1951. The plant at Volta Redonda is the biggest in South America.

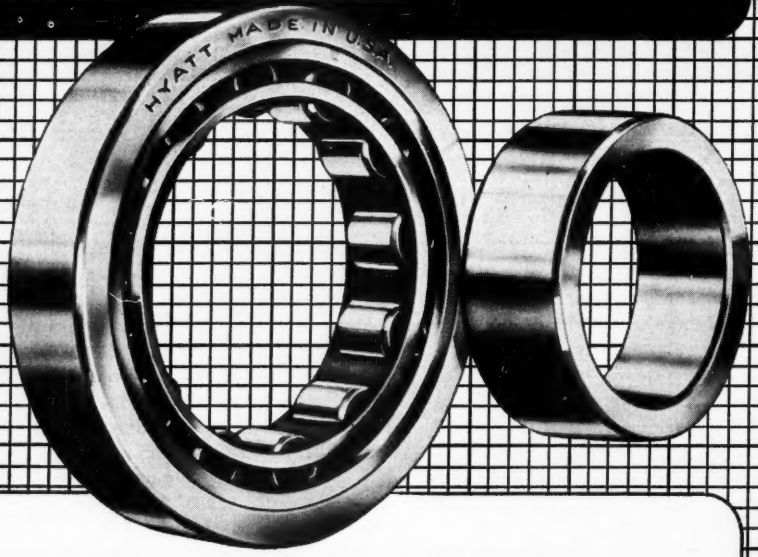
Mexico has an established and growing steel industry which produced 390,000 tons steel ingots and 350 tons pig iron in 1951. Plants are located at Piedras Negras, Monclova, Monterrey and Mexico City.

Other steel producing nations in Latin America are: Chile, Argentina, Colombia, Uraguay and Venezuela.

Peru has no steel capacity now, but will build a plant at Chimbote having an electric furnace, two reduction furnaces, a steel plant and rolling mills.

HYATT HY-LOADS . . . for Capacity Separability and Long Life





IN THE family of Hyatt Hy-Load Roller Bearings is the popular A-TS type, one of the separable inner race, high-capacity cylindrical roller bearings made in two diameter series, wide and narrow widths, to standard boundary dimensions.

Separable parts are freely interchangeable. Any inner race will fit any roller assembly of the same piece number, permitting non-selective fitting after preassembling the two bearing parts in separable machine elements.

Along with their well-known load-carrying capacity, separability features and long life, Hyatt Roller Bearings also assure smoother operation, less maintenance and better machine design.

We will be glad to send you literature covering Hy-Loads and all other Hyatt Roller Bearings. Ask for Hyatt Catalog 150. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Fords Modeled in Plastic

A craftsman in the new model shop at the Ford Motor Co.'s manufacturing engineering department is trimming a scale plastic model of a Ford passenger car production part. It will be checked against dimensions of the print. Other scale parts are inner door panels, finders, instrument panels and floor pan

Plastics dies may bring about a revolution in automotive stamping plants. Aircraft firms have used them for some time because they are comparatively inexpensive

A REVOLUTION may be in the making in automotive stamping plants. A "highly successful" installation of plastic dies has now been made by one of the large truck builders and another industry member will soon give the material a try-out.

Plastic dies have become fairly standard in the aircraft industry. But one unhappy experience early in the postwar period made the automakers a little slow on the uptake. The bugs of dimensional instability and susceptibility to cracking now have been removed with the result that the new material and new technique appears to be a natural.

Work Cut Back—The first reason it looks so good to stamping plant managers is that it eliminates all but a tiny fraction of the work involved in making the conventional steel or iron die. In the usual die-making operation labor is the all-important expense. The die barbers are the aristocracy among skilled workmen. Thirty-six dollars worth of die steel may turn out to be a $6000 die, the difference being accounted for almost entirely by the labor involved in turning out an intricately shaped depression or protrusion to be used for deep-drawing a part.

A plastic die, on the other hand, is made merely by the molding process, cast in a plaster "splash" taken from the original pattern of wood, metal or plastic. Instead of several weeks tied up on Keller machines and the laborious hand-finishing operations, as is often necessary with cast iron or steel dies, the plastic dies are ready for use in about two days, one of which is spent in heat-curing operation.

Fake Step—The possibility of a misstep in heat-treatment of a finished metal die, with the possible resultant loss of the previous work which has gone into it, is avoided with the plastic material.

Another reason for its good chance of solid acceptance in the stamping industry is the reduction of down-time of presses. The relatively short runs on aircraft parts have not made this feature worth special note to now, but in the mass-producing auto industry any way to cut down-time means real money. There is no experience yet on which to base estimates on the length of life of a plastic die. But even if it is only 100,000-200,000 pieces, the material may prove to be cheaper than metal dies. For one thing a number of dies can be made and held in standby. For another, the plastic material can be repaired easily, in some cases without removing the die from the press.

Innovator—Behind this plastic die development is Rezolin Inc., Los Angeles, which calls its material "8000" Tool Plastic. This casting resin is already being used by some automakers for their master models, and has the advantage over the mahogany wood models, traditionally used in the industry, of being unaffected by moisture and retaining accuracy indefinitely.

Ford Tries Plastics

Die-making is not the only place where plastics are making themselves important in the industry. Ford Motor Co. is using plastics in another unusual way—to make parts by which every department connected with design, production, process engineering, materials handling and purchasing can visualize the finished product.

This is not using plastics in the sense of a five-and-dime molded toy. Exact replicas of stampings, castings, forgings, etc., are made to scale or to full-size with these purposes: To design for manufacture; to spot problems likely to arise in metal forming; to aid in tool-up; to learn in advance the action of the parts under stress; to enable suppliers to see what is wanted.

These plastic prototypes have

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

made an outstanding success record with Ford—mainly because of the time-saving they make possible. As compared with hand-made models in steel which may require as long as three months to obtain, formed plastic parts of possibly more exactness can be made in two days. One plastic assembly used by Ford in engineering its 1952 models was constructed for $150 as against $4000 for the corresponding hand-made metal parts. It has been found to be possible to redesign parts and make new ones in plastic faster than the draftsmen could draw the new parts as details with dimensions. The first 54 problems tackled by a special department set up in Ford for the sole purpose of constructing the plastic models, with only seven craftsmen engaged, saved the company an estimated $500,000.

Manpower Pinches Ford Foundry

Production at Ford's new Cleveland foundry has gotten under way, and engine-block castings and other iron parts are being fed to the adjacent engine plant. Step-up in operations will continue until fall when a leveling-off point will be reached, according to Plant Manager E. C. Lester. In trade circles is the report that shortage of foundry manpower is preventing the operation from going beyond a one-line setup.

Personnel Changes at L-M

R. P. Powers has been named general manufacturing manager of the Lincoln-Mercury Division of Ford Motor Co., and N. S. Brown becomes production manager of the division's four assembly plants. In his new post Mr. Powers, who has been manager of forward product production engineering, will be in charge of all manufacturing activities including production, programming and control, manufacturing engineering, traffic, plant engineering, quality control and assembly plant operations.

Chevrolet Spends To Save

"You have to spend money to make it." General Motors Chevrolet division at Flint spent $500,000 for a waste treatment plant to stop oil and chemical pollution of the Flint river four years ago. Since then three big benefits have resulted: The plant no longer is putting out harmful products—Flint and the state like that; chromium is being saved—that pleases defense program officials; and Chevrolet is helping itself on the cost of the treatment plant by its savings in chromic acid. The program has been such as to win for Chevrolet the first award of the kind given by the Michigan United Conservation Clubs.

In accepting MUCC's plaque, C. W. Hathaway, general superintendent of Chevrolet's metallurgical laboratory, Detroit, described how the water pollution nuisance was eliminated and wastes were turned to Chevrolet's advantage. By converting its liquid cyanide heat-treating to induction heating and to carbo-nitride gas processes, and by eliminating cyanide from plating operations, said Mr. Hathaway, the hazard of cyanide pollution of the river was dispelled. "The biggest dollar and defense saving has been made by salvaging chromic acid from rinse tanks in the plating plant. Instead of letting these overflow into drains, contents of these rinse tanks are now concentrated by vacuum evaporations, salvaging a large portion of the chromic acid for re-use in the plating tanks and returning the distilled water from evaporators to the rinse tanks," he stated. Additionally the division has been able to salvage on the average 30,000 gallons of emulsified oil from machining operations at Flint.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	576,504	680,281
May	542,075	695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	1952	1951
May 24	127,723	158,259
May 31	104,892	121,476
June 7	128,807	152,656
June 14	130,544	157,026
June 21	129,574	158,909
June 28	125,000*	156,105

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

New Business from Arsenal Shift

The change in management of another foundry is expected to make available some interesting new business to the foundry industry. The Detroit Arsenal, with an experimental foundry equipped with two electric furnaces capable of producing steel, brass, bronze and aluminum castings, is in the process of being transferred to the Chrysler Corp.

Used pretty much on a job shop basis by the Ordnance Department while it ran the Arsenal, the foundry came in handy when some supplier would get snarled up or when a particularly tricky casting was being worked with. Chrysler undoubtedly will use it in the same way. But the experimental work which could be done with the foundry when it was under Ordnance's wing will now have to be farmed out. Some Ordnance officials decry the paper work which will be involved in letting such contracts, and say there will probably be a greater time lag to get work through busy steel foundries than they have had when they had control of the foundry, but nonferrous shops around this area will welcome a try at the orders.

Steel Strike Dampens Auto Sales

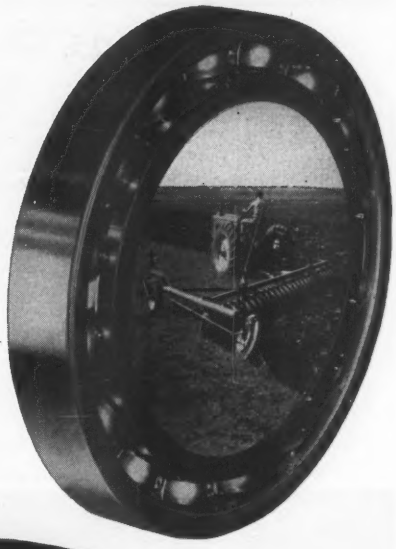
It's too early to know exactly how much of a smothering effect the steel strike had on June automobile sales. But the indications are it nipped the bloom right off a just-opening rose.

This was the fear some of the shrewder automen had when the strike began. They discounted the talk that the threat of a shutdown in auto output would scare people into showrooms, and came to the conclusion there was a good chance that prospects would hole up at least until there were clear signs that the paychecks wouldn't be cut off.

The steel strike threw a monkey wrench into the automakers' production plans too. It's forcing purchasing men to beat bushes to snag conversion ingots.

No conversion problem ...

in these dual-purpose plants

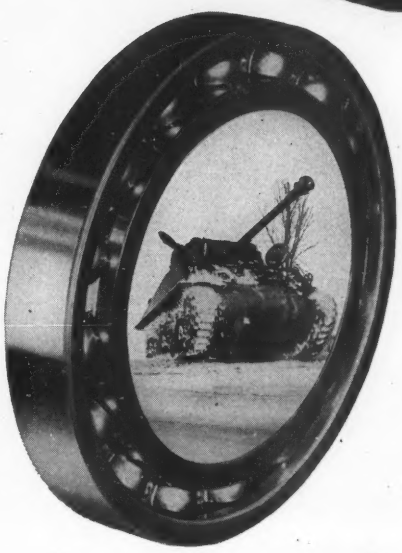


Jig borers and jets, trucks and tanks, household appliances and electronic instruments, all use New Departure ball bearings of the same materials, same heat treatment, the same methods of precision manufacture.

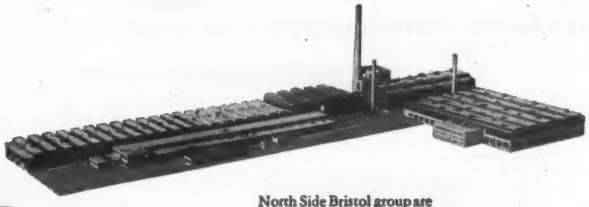
Thus conversion from one to the other in New Departure's three great plants is largely a matter of changing the emphasis on types and sizes.

The capacity of the world's largest ball bearing plants is your assurance of the best possible production schedules.

New Departure's engineers and vast resources for research are freely at your disposal.



Nothing Rolls Like a Ball...



North Side Bristol group are "guns-and-butter" plants.

NEW DEPARTURE

BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS CORPORATION • BRISTOL, CONNECTICUT

166

What tube steel gives you the best life/cost ratio? Ask the experts!

This month's report is on: **2% CR.-MO.**

Has intermediate corrosion resistance in combination with good creep strength and fair resistance to oxidation. For use at temperatures up to 1200° F. in cracking coils, reforming units, heat exchangers, vapor line and hot oil piping, and return-bend forgings for oil heaters.

23 TIMKEN® STEELS FOR HIGH TEMPERATURE SERVICE

Carbon	Sicromo 2	Sicromo 5S	16-13-3*
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	25-20*
DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-12*
Silmo	Sicromo 3	Sicromo 9M	35-15*
DM	4-6% Cr.-Mo.	18-8 Stainless	16-25-6*
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	

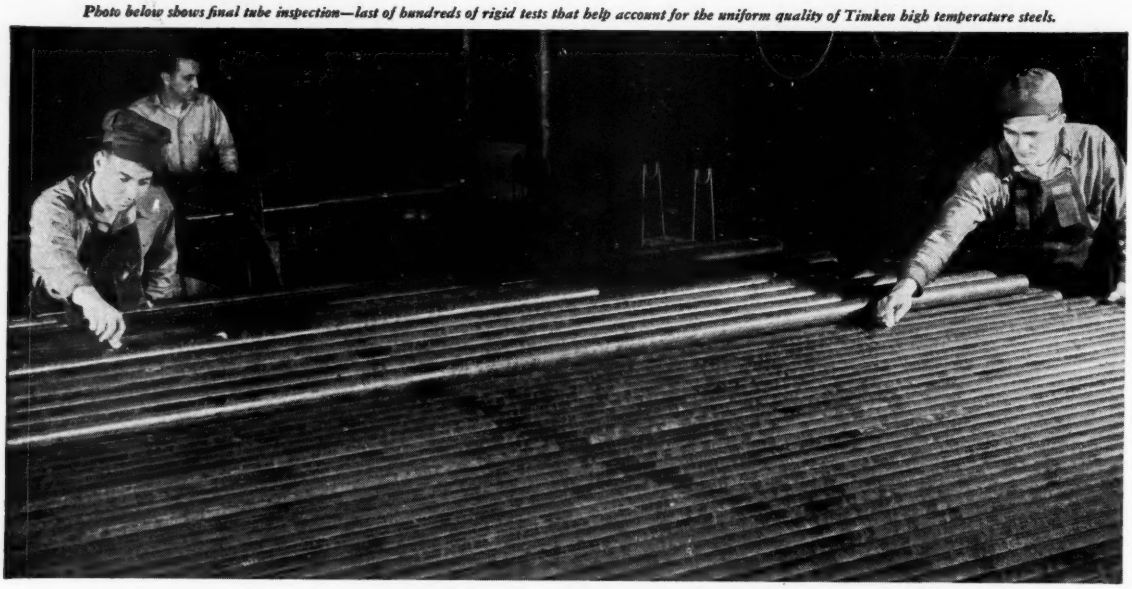
*Not available as seamless tubing at the present time.

MAYBE you can find several high temperature tube steels that will solve your particular set of heat, pressure, corrosion and oxidation problems. But there's only *one* steel that will give you maximum tube life per dollar—the best life/cost ratio.

To find that one steel, go to the metallurgists of The Timken Roller Bearing Company. They're recognized authorities on high temperature steels. Backed by 20 years' experience and research and with 23 different analyses at their disposal, they'll help you choose the one best steel for your application. And you'll be assured of uniform quality in every tube because of the Timken Company's rigid quality control from melt shop through final inspection.

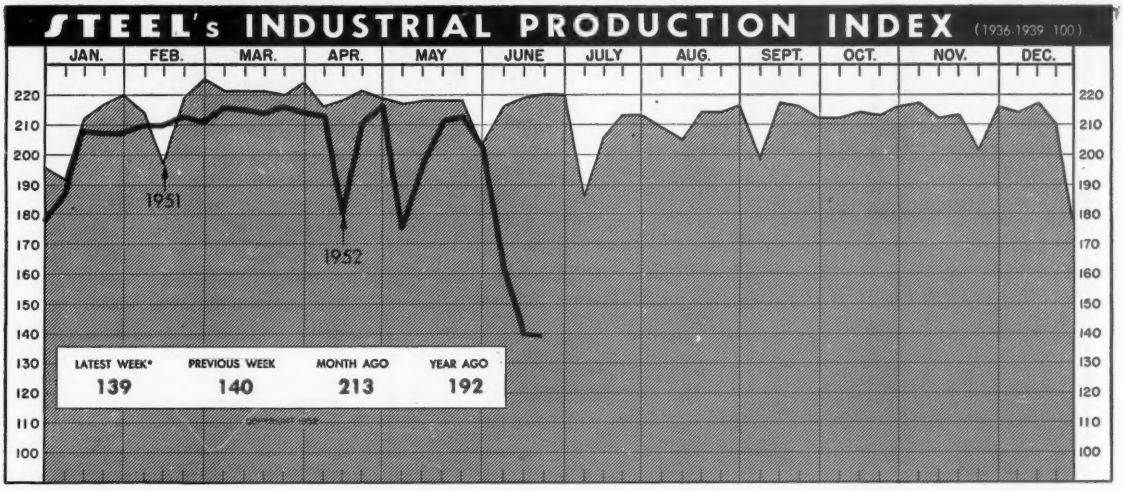
Our "RSQ"—Research, Supply, Quality—can solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Photo below shows final tube inspection—last of hundreds of rigid tests that help account for the uniform quality of Timken high temperature steels.



YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939 100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110 100
1951
1952
LATEST WEEK* 139
PREVIOUS WEEK 140
MONTH AGO 213
YEAR AGO 192

Week ended June 21 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Cutbacks loom on the industrial horizon as many metalworking companies have only enough steel for one more production week. Industrial activity index levels off

CUTBACKS loom high on the production scene, as many steel users have just about scraped the bottom of the inventory barrel for certain specifications.

Famine — Most metalworking companies have only enough steel on hand to sustain present operations one more week. But the steel famine already has trimmed operations of some durables producers. General Motors Corp. cut output severely at its Indianapolis Chevrolet plant last week, while Hotpoint Inc. closed down its production of civilian electrical equipment. International Harvester Co. and Nash-Kelvinator Co. plan cutbacks for July 3. Other cutbacks were in the making.

While users of large amounts of steel, like the automotive industry and freight car builders, will be among the first really hard hit by the steel shortage there won't be an industry closedown pattern.

Geographical — The cutbacks may be on a regional basis. Companies in the Pittsburgh area, for instance, apparently have more steel stashed away than manufacturers in Detroit and Chicago.

There was no escape in sight from a seige of industrial slowdowns. Steel plants need about ten days to regain capacity production after a strike. So it will be some weeks later before most metalworking companies can obtain enough steel for full operations again.

Index Levels Off . . .

After plunging downward in the previous two weeks, STEEL's industrial activity index declined only slightly further in the week ended June 21 to 139 per cent of the 1936-1939 average. That's only a 1-point decline from the previous week, but 74 percentage points under the reading for the week ended May 24, the last full workweek before the strike. Steel output in the week ended June 21 edged down 0.5 of a percentage point from the previous week, and auto and truck assemblies declined slightly from the previous week.

Auto Output Maintained . . .

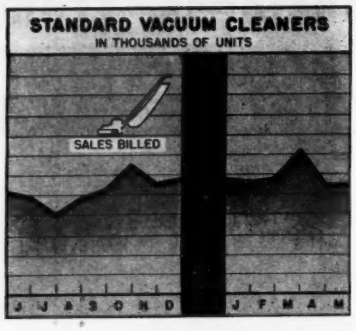
The auto industry apparently is driving for all the production possible before the steel shortage closes its plants in July. As orders for passenger cars pour in from dealers, the industry is trying to assuage the customer's demand while it is still hot. U. S. plants assembled 94,687 passenger cars in the week ended June 21, a drop of 493 units under the previous week's output. Truck production by U. S. plants that week edged up slightly from the previous week to 25,082 units.

Canadian operations are already feeling effects of the steel strike as auto-truck output slipped to 9805 units in the week ended June 21, from 10,430 autos and trucks assembled in the previous week.

Combined U. S. and Canadian output amounted to 129,574 autos and trucks in the week ended June 21. That's only 970 units under output in the previous week. In the same week last year, U. S. and Canadian plants produced 158,909 auto and truck assemblies.

Steel: Only a Trickle . . .

As the steel strike neared the end of its fourth week, the nation's steel production was only a trickle. The industry turned out 252,000 net tons of steel for ingots and castings in the week ended June 28, the American Iron & Steel Institute estimated. That equals the industry's turnout in the previous week. In the comparable week a

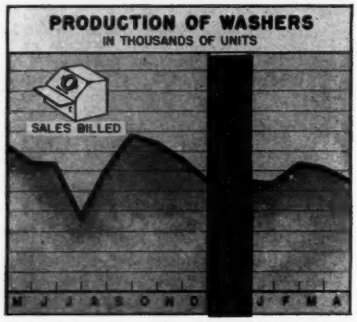


Standard Vacuum Cleaners

Sales Billed—Units

	1952	1951	1950
Jan.	223,357	282,305	249,150
Feb.	230,226	261,572	263,515
Mar.	290,092	290,242	361,014
Apr.	217,169	227,216	292,664
May	216,969	201,983	278,645
June	.....	194,548	250,190
July	.....	161,002	279,967
Aug.	.....	191,299	341,232
Sept.	.....	210,086	327,524
Oct.	.....	259,469	331,445
Nov.	.....	219,919	265,310
Dec.	.....	230,263	288,756
Total	.....	2,729,104	3,529,414

Vacuum Cleaner Mfrs. Assn.

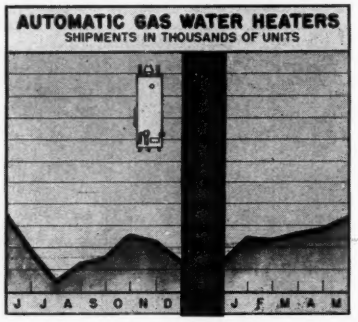


Household Washers

Sales Billed—Units

	1952	1951	1950
Jan.	213,998	321,092	275,576
Feb.	255,864	341,328	342,967
Mar.	248,431	368,455	423,802
Apr.	217,211	292,193	333,072
May	.....	253,942	304,640
June	.....	253,119	325,217
July	.....	139,779	282,261
Aug.	.....	239,081	381,452
Sept.	.....	313,756	424,043
Oct.	.....	297,210	439,924
Nov.	.....	262,484	379,964
Dec.	.....	218,664	377,013
Totals	.....	3,301,123	4,289,931

American Home Laundry Mfrs. Assn.

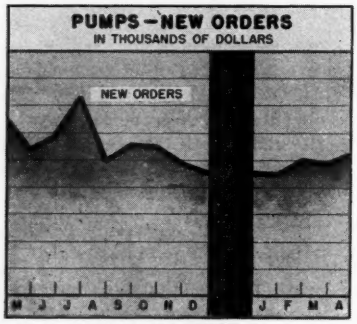


Automatic Gas Water Heaters

Shipments in Units

	1952	1951	1950
Jan.	148,700	225,600	131,600
Feb.	146,100	213,400	156,500
Mar.	152,200	223,300	172,800
Apr.	156,900	199,400	176,400
May	167,400	167,400	195,200
June	.....	131,500	207,100
July	.....	102,400	197,500
Aug.	.....	124,400	259,800
Sept.	.....	130,900	222,600
Oct.	.....	148,800	235,100
Nov.	.....	143,400	206,000
Dec.	.....	127,200	202,500
Total	.....	1,931,200	2,363,100

Gas Appliance Mfrs. Assn.



Pumps, New Orders

In Thousands of Dollars

	1952	1951	1950
Jan.	5,517	6,477	2,586
Feb.	6,020	6,480	2,938
Mar.	5,925	7,654	3,313
Apr.	6,354	7,583	3,376
May	.....	6,371	3,668
June	.....	6,852	4,153
July	.....	8,358	4,080
Aug.	.....	5,911	6,429
Sept.	.....	6,552	5,191
Oct.	.....	6,506	4,985
Nov.	.....	5,908	5,961
Dec.	.....	5,553	6,720
Total	.....	80,175	53,400

Hydraulic Institute.

Charts—Copyright 1952, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....June 9	Gear Sales .....May 26	Radio, TV .....June 16
Durable Goods ....June 23	Gray Iron Castings.June 2	Ranges, Elec. .....June 16
Employ., Metalwkg. June 23	Indus. Production ..May 26	Ranges, Gas .....June 16
Employ., Steel ....Apr. 28	Ironers .....May 12	Refrigerators .....June 16
Fab. Struc. Steel ..June 9	Machine Tools ....June 2	Steel Castings .....June 2
Freight Cars .....May 26	Malleable Castings .June 2	Steel Forgings ....June 9
Foundry Equip. ...June 9	Prices, Consumer...May 19	Steel Shipments ...June 23
Furnaces, Indus. ..May 26	Prices, Wholesale...May 19	Wages, Metalwkg...June 23

month ago, the nation's steel plants produced 2,091,000 net tons of steel for ingots and castings.

Tool Output Up . . .

Unfavorable trends keep gaining momentum in the machine tool market. While U. S. tool output is soaring, new orders continue well below the industry shipments. The National Machine Tool Builders Association index for May places the nation's machine tool output at 320 per cent of the 1945-1947 average, while new orders dropped to 286.3 per cent. Industry shipments in May reached 322.3 per cent. Foreign orders that month rose 31.4 per cent on the index, highest reading since January, but well under the 1951 average. As of June 1, the industry's backlog of orders would maintain present production less than 14 months, compared with a 14-month backlog in April and a 20-month backlog in May, last year.

Refrigerator Sales Cool . . .

Manufacturers of electric refrigerators found that the hoped-for sales upturn just didn't appear this spring. Total factory sales of electric refrigerators fell to 62,746 units in May, compared with 83,485 refrigerators sold in April and 118,823 units sold in May, 1951, says the National Electrical Manufacturers Association.

Electric ranges fared little better than refrigerators in May. Factory sales totaled 255,009 units, compared with 298,092 units sold in April. Electric range sales amounted to 409,887 units during May, 1951.

Water Heater Sales Rise . . .

Unlike electrical equipment and other durables, industry shipments of gas water heaters and gas house-heating equipment showed a steady rise during the first five months of 1952. Shipments of gas water heaters totaled 159,300 units in May, a rise of 2400 units from April and a drop under the same month of last year by only 4.8 per cent.

Gas-fired central heating equipment (furnaces, boilers and conversion burners) totaled 54,600

unit shipments in May. That's a 29 per cent increase over the 42,100 units shipped in May, 1951. Gas-fired furnaces rose to 32,000 unit shipments, 19 per cent above May, 1951. Gas-fired boilers and gas conversion burners totaled 3700 and 18,900 units, respectively. May shipments of boilers and burners were 12 and 59 per cent above the year-ago figures.

Living Costs Climb . . .

The Labor Department's cost-of-living index in May climbed close to the all-time peak set in January.

The index in May reached 189 per cent of the 1935-1939 average. This is a rise of 0.2 of a percentage point over the previous month and only 0.1 of a percentage point under January.

The new figure means a 2-cent hourly wage raise for 1,250,000 railroad workers and at least 100,000 textile, aircraft and oil refinery workers.

Construction Towers Upward . . .

Many architects and contractors are finding work easily as the construction business enjoys a mild boom. Total value of new construction in May reached $1594 million in the 37 states east of the Rockies, estimates F. W. Dodge Corp. Building valuation in May amounted to $1244 million in those states.

Housing starts also remained at high levels in May. The Labor Department reports that 107,000 new permanent nonfarm dwelling units were started in May. That's a small decline of 1000 units from April, but an increase of 5000 more units than were started in May, 1951. During the first five months of the year, 418,000 dwelling units were started, 1900 under the year-ago starts.

Trends Fore and Aft . . .

Shipments of gray iron castings totaled 1.2 million net tons in April. Unfilled orders amounted to only 1.6 million net tons on May 1 . . . Freight car loadings in the week ended June 14 ran 23 per cent below the year-ago loadings . . . Loans to metalworking companies increased $64 million in the week ended June 11 . . . After declining steadily for five weeks, business failures shot up 55 casualties to 175 in the week ended June 12 . . . Department store sales in the week ended June 21 jumped 9 per cent over year-ago sales. Father's Day did it . . . Steel forgings shipped in April totaled 277,000 tons, 4 per cent above the 266,372 tons shipped in the previous month.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	12.5	13.0	103.0
Electric Power Distributed (million kwhr)	7,000[1]	7,126	6,834
Bituminous Coal Output (daily av.—1000 tons)	1,212	1,250	1,704
Petroleum Production (daily av.—1000 bbl)	6,150[1]	6,148	6,192
Construction Volume (ENR—millions)	$305.7	$243.9	$207.4
Automobile, Truck Output (Ward's—units)	129,574	130,544	158,909
TRADE			
Freight Car Loadings (unit—1000 cars)	630[1]	631	833
Business Failures (Dun & Bradstreet, number)	151	175	180
Currency in Circulation (millions)[3]	$28,787	$28,830	$27,479
Dept. Store Sales (changes from year ago)[3]	+9%	+2%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19.202	$15,108	$17,829
Federal Gross Debt (billions)	$259.6	$260.2	$254.4
Bond Volume, NYSE (millions)	$12.4	$18.5	$11.8
Stocks Sales, NYSE (thousands of shares)	5,672	6,177	5,711
Loans and Investments (billions)[4]	$74.0	$73.7	$69.5
United States Gov't. Obligations Held (billions)[4]	$32.1	$31.9	$30.6
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	221.8	223.7	226.0
All Commodities[7]	111.2	111.7	115.0
All Commodities Other Than Farm and Foods[7]	112.5	112.4	116.6

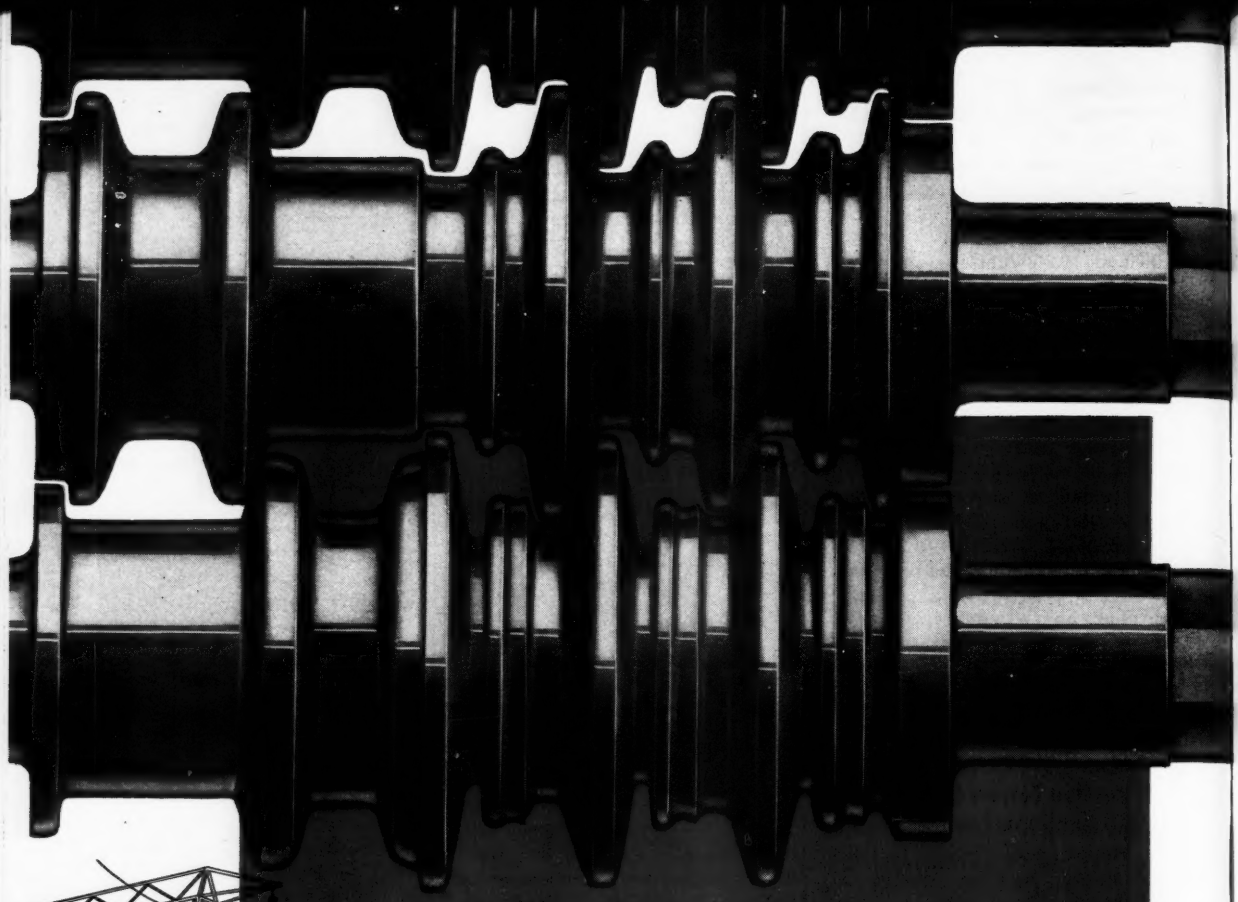
* Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

For Fast Dependable WAREHOUSE SERVICE

Rely on **VIKING**

- COLD FINISHED BARS—Rounds Hexagons, Flats and Squares
- ALLOY COLD FINISHED BARS
- HOT ROLLED BARS—Rounds Flats and Angles
- STRUCTURALS—Channels Angles and Beams
- HOT ROLLED PLATES
- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
- YOLOY PRODUCTS—Angles Flats, Plate and Sheets
- DEFORMED REINFORCING BARS
- WELDED WIRE MESH
- SOFT BLACK ANNEALED WIRE
- BRIGHT BASIC WIRE AND WIRE RODS
- WIRE ROPE AND FITTINGS

VIKING STEEL COMPANY
16700 St. Clair Ave.
CLEVELAND 10, OHIO
1003 Fisher Bldg., Detroit 2, Mich.



Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

STEPPED-UP PRODUCTION

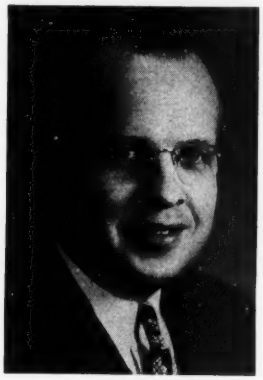
Greatly-enlarged plant facilities at Lima mean more Ohio Rolls to enhance your production. Choose from 11 types of Ohio Iron and Steel Rolls:

- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Holl-O-Cast Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Flintuff Rolls
- Ohio Double-Pour Rolls

THE OHIO STEEL FOUNDRY CO.

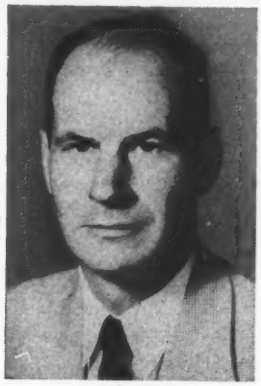
LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry



ELMER R. RANSOM
. . . V. P., Richards-Wilcox Mfg.

DANIEL H. HARKNESS
. . . sales mgr., W. & L.E. Gurley



L. G. JOHNSON
. . . joins Lone Star Steel

Elmer R. Ransom, manager of the R-W OveR-Way Division, was elected vice president of **Richards-Wilcox Mfg. Co.,** Aurora, Ill. He continues supervision of activities of the OveR-Way Division.

United States Hoffman Machinery Corp., Syracuse, N. Y., elected **George E. Bowdoin** president to succeed **Albert C. Bruce,** now chairman of the board. **Marvin H. Green** was elected vice president.

Howell G. Evans, formerly vice president of sales, was elected to the newly created position of senior vice president, **Hamilton Mfg. Co.,** Two Rivers, Wis. He is succeeded by **R. G. Halvorsen. C. S. O'Neil** becomes vice president in charge of research.

William C. McKenzie Jr. was appointed by **Tennessee Coal & Iron Division, U. S. Steel Co.,** to the newly created post of senior staff engineer, raw materials division. He advances from chief engineer, ore mines and quarries, where he is replaced by **Leland H. Johnson. James D. F. Evans** replaces Mr. Johnson as mining engineer, ore mines and quarries division.

O. H. McCleary, vice president and general manager, **Mathews Conveyer Co.,** Ellwood City, Pa., was elected vice president of the Canadian subsidiary, Mathews Conveyer Co. Ltd., Port Hope, Ont. **Chesley A. Paul,** formerly purchasing agent, Mathews Conveyer Co., was elected vice president of purchasing.

Daniel H. Harkness was named sales manager, **W. & L. E. Gurley,** Troy, N. Y., manufacturer of engineering and scientific instruments. He also is secretary of the firm.

H. C. Bughman Jr. was elected chairman, **Union Spring & Mfg. Co.,** New Kensington, Pa. **W. F. McCabe** was elected president and **Clarence Abitz** vice president.

Charles G. Crossland was named purchasing agent, **Greenville Steel Car Co.,** Greenville, Pa. He was assistant to the late **Frederick D. Enterline,** company purchasing agent for many years.

Harold H. Shincel was appointed an executive vice president, **Consolidated Car Heating Co.,** Albany, N. Y.

Victor L. Johnson was advanced from building materials product manager to director of purchases at **Southern States Iron Roofing Co.,** Savannah, Ga. **Jule Petris** succeeds Mr. Johnson and **Francis Dasher** becomes office manager.

Frank L. Magee, vice president and general production manager, **Aluminum Co. of America,** Pittsburgh, was elected a director. **Alfred M. Hunt,** director, succeeds **J. R. D. Huston,** retired, as secretary.

Research Corp. appointed **Schaeffer E. Specht** executive sales engineer. He will have headquarters at its Bound Brook, N. J., plant.

L. G. Johnson was added to the sales staff of **Lone Star Steel Co.,** Dallas, in charge of sales of steel tubular goods at its new oil field tubular goods mill which plans to begin production of pipe by Jan. 1, 1953. Mr. Johnson formerly was with Republic Steel Corp., American Steel Warehouse Co. and most recently with Kaiser Steel Corp.'s Houston office.

Weaver E. Falberg was appointed manager, alloy steel division, **Joseph T. Ryerson & Son Inc.,** a subsidiary of Inland Steel Co., Chicago.

J. H. Phillips joined **Steel Trading Corp.,** Pittsburgh. He retired from the post of general purchasing agent, Pittsburgh Steel Co., last year after serving that company for 34 years.

Robert A. Ruleff was named western sales manager, **Bart-Messing Corp.,** Belleville, N. J.

A. L. Fairley Jr. was elected assistant vice president, **Shenango Furnace Co.,** Pittsburgh. **W. Laird Davis** becomes assistant secretary, **Shenango-Penn Mold Co.**

Robert W. Hipkiss was promoted to the new position of manager, tool division, **Barcalo Mfg. Co.,** Buffalo. **John S. Deans** becomes contract sales manager.

John B. Cording Jr. assumes the duties of district manager of sales, Syracuse, N. Y., office of **Lukens**

Steel Co., Coatesville, Pa., effective July 1. He succeeds **Breo LaPierre**, retiring.

J. C. Doyle, Ford Division central regional sales manager, was appointed sales and advertising manager, **Ford Motor Co.**, Dearborn, Mich.

Carl A. Salmonsen is acting general manager of **General Electric Co.'s** control department, Schenectady, N. Y., to replace **Karl R. VanTassel**, recently appointed general manager, Knolls Atomic Power Laboratory-operating department. **E. E. Bauer** was made manager of power transformer apparatus sales at Pittsfield, Mass.

Ralph H. Buck is now assistant general manager, Dallas division, **Revere Copper & Brass Inc.**

R. N. Stoddard was appointed midwest regional sales manager, electronic tube division, **Westinghouse Electric Corp.** His headquarters are at the Merchandise Mart, Chicago. **Jay M. Allen** was named manager of manufacturing and **Ricardo Muniz** superintendent of manufacturing at the television-radio division in Sunbury, Pa.

Fitz L. Sargeant was named regional general manager, south central region sales office, **Reynolds Metals Co.**, with headquarters in St. Louis.

Ohio Steel Foundry Co. elected **Willard P. Dudley** vice president in charge of production at its Lima and Springfield, O., plants. He succeeds **Edwin A. Walcher**, retired. **John L. Crouse** succeeds Mr. Dudley as secretary-treasurer.

R. L. HESS JR.
. . . a V. P. of Rust Engineering

R. L. Hess Jr. was elected a vice president, **Rust Engineering Co.**, Pittsburgh. He formerly was secretary of the company.

H. K. Johnson was named controller of the Canton, O., division of **E. W. Bliss Co.** He succeeds **F. J. Delorme**, named secretary and assistant treasurer.

Link-Belt Co. appointed **Robert W. Suman** as chief engineer for its new Colmar, Pa., plant and **Norman Virkler** to succeed Mr. Suman as chief engineer, Philadelphia plant.

A. R. Van Vorst was appointed assistant manager, tube and extrusion sales, **Aluminum Co. of America**, Pittsburgh.

Bethlehem Pacific Coast Steel Corp. promoted **L. A. Anderson** from assistant general superintendent to general superintendent of its South San Francisco plant to succeed the late **W. C. Eshelman. George W. Teskey** succeeds **C. W. Jones**, retired, as superintendent of the open-hearth department.

William G. Laffer was made vice president-operations of the original equipment division, **Cleveland Graphite Bronze Co.**, Cleveland.

Carl T. Blumenschein was appointed purchasing agent, **General Fireproofing Co.**, Youngstown.

S. James Aires Jr. is now manager, commercial research, in the market development department of **Lukens Steel Co.**, Coatesville, Pa. He succeeds **Richard W. Dalzell**, now assistant manager of market development.

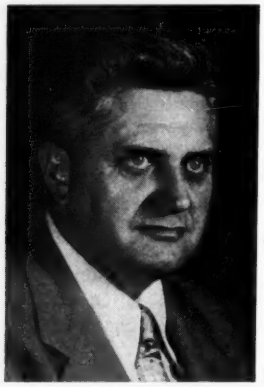
Elwood M. Keifer was promoted to sales engineer by **Snyder Tool & Engineering Co.**, Detroit.

Jacob Vandenberg and **John S. Holland** joined the staff of **National Lead Co.'s** mining department, New York.

Walter L. Connell was promoted to regional manager, **American Pulley Co.**, Philadelphia. He is succeeded by **Gail E. Cogan** as Minneapolis district manager. **Robert E. Kochs** was named district manager, Rochester territory.

Paul G. Mayer was appointed assistant to the vice president-sales at **Hydropress Inc.**, New York.

Walter J. Lee, assistant general manager, was promoted to general manager, rim division, **Goodyear Tire & Rubber Co.**, Akron. He succeeds **J. G. Swain**, who becomes



WILLARD P. DUDLEY
. . . Ohio Steel Foundry V. P.

L. A. ANDERSON
. . . a gen. supt., Bethlehem Pacific

WALTER J. LEE
. . . gen. mgr., Goodyear's rim div.

The Superior Tube That Speeds Up The Race

Furnishing tubing that speeds a customer's production processes is a Superior specialty.

A case in point is illustrated above. The customer, New Hampshire Ball Bearings, Inc., manufactures high-speed, precision ball bearings. They formerly machined the races for certain of their smaller sized bearings from solid stock. This represented a considerable material loss . . . and a substantial time loss in the manufacturing process.

Prime requirements for the races were concentricity within 10% of the race wall thickness, dimensional tolerances under .002" and hardness. After consultation with us the customer began to fabricate these races from 52100 Alloy Steel tubing. Time, material and money were saved and the product improved.

Such savings are almost a commonplace with Superior customers. Because of our long experience in standard production of what is generally regarded as specialty tubing, we can frequently supply a quick and easy solution to the most difficult problems . . . and generally do so without charging "premium" or special handling prices.

If you have a need for fine small tubing in any analyses . . . almost any shape . . . and of a superior quality . . . it will pay you to check with us. We may be able to fill your needs from stocks of our selected distributors in key cities. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Penna.

BE SURE ABOUT TUBING—
SPECIFY **Superior**
THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅝" O.D.
Certain analyses (.035" max. wall) up to 1⅜" O.D.

ROUND AND SHAPED TUBING
Available in:

Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095

Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317 321, 347, 403, 410, 420, 430, 446, T-5

Nickel Alloys:
Nickel, "D Nickel"®, "L Nickel"®, "Monel"®, "K Monel"®, "Inconel"®, 30% Cupro Nickel.

Beryllium Copper

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

*Reg. U. S. Trademark International Nickel Company

consulting manager, retaining full and active interest in the division. **Hilton J. Lafaye** continues as sales manager.

Richard N. Benson and **Peter D. O'Neill** were promoted to field engineers for **Republic Rubber Division**, Lee Rubber & Tire Corp., and assigned to the Chicago district office. **Stephen P. Terlecky** also becomes a field engineer in the Philadelphia district office.

Pivot Punch & Dye Corp., North Tonawanda, N. Y., appointed **Paul L. Allwein** assistant to the works manager and **James G. Deckert** as controller.

Micromatic Hone Corp., Detroit, appointed **Gerald Carlisle** treasurer to fill the post recently resigned by **A. J. Prentice. Paul E. Curran** becomes secretary and assistant treasurer, assuming Mr. Carlisle's former duties. **William E. Long** was promoted to assistant secretary.

John L. Marsh joined **National Electric Products Corp.** as midwest regional specialist on all products. He has headquarters in Chicago.

Clinton R. Milstead was appointed public relations field representative for the southeast district of **U. S. Steel Co.** with headquarters in Birmingham.

Leo M. Brown was appointed assistant sales manager, **St. Paul Hydraulic Hoist**, Minneapolis, division of Gar Wood Industries Inc.. He is succeeded as south central district manager by **Edward R. Curry.**

George N. Landis was appointed chief electrical engineer of the newly created electrical department of **Hydropress Inc.**, New York, and its Loewy Rolling Mill Division.

EDWARD J. BENNAN
. . . exec. V. P., Jefferson Electric

James M. Bennan was elected chairman of the board and re-elected president of **Jefferson Electric Co.**, Bellwood, Ill. As board chairman he succeeds the late **James C. Daley**, one of the company's founders. **Edward J. Bennan** was elected executive vice president and a director. He previously served as vice president of manufacturing.

Cutler-Hammer Inc., Milwaukee, appointed **H. B. Phillips** sales manager, quantity sales division, comprising heating device sales, refrigeration control sales and small motor switch sales. **Charles G. Sims** was named division manager, small motor switch sales, which includes aircraft switches, circuit breakers and contactors.

American Box Co., Cleveland, promoted **W. A. Eger** to assistant sales manager.

United States Radiator Corp., Detroit, elected **Roland P. Place** chairman of the board and **W. C. McCord** as president. Both offices previously were held by **Wesley J. Peoples** who continues as a director and adviser and consultant.

JOSEPH A. ROSA
. . . forging sales mgr., Burke Steel

Joseph A. Rosa was appointed manager of forging sales by **Burke Steel Co. Inc.**, Rochester, N. Y. He has been with the alloy steel division of Republic Steel Corp., for the last eight years as field representative of its metallurgical department.

Paul E. Hays was appointed assistant superintendent, river transportation department, **Crucible Steel Co. of America**, Pittsburgh. **F. J. Hilsinger** becomes assistant controller and head of the operations and sales accounting department. **D. A. Porco Jr.** was appointed supervisor of sales accounting. **W. W. Rinehart Jr.** succeeds Mr. Hilsinger as works controller, Midland Works.

Nelson Stud Welding Division, Gregory Industries Inc., transferred its eastern regional headquarters from New York to a new factory branch warehouse just opened at 785 Baltimore Pike, Springfield, Pa. **Richard E. McGinnis** was named eastern regional manager.

Lawrence E. Morris was promoted to superintendent of plant facilities at **Willys-Overland Motors Inc.**, Toledo, O.

OBITUARIES...

Forest J. Smith, 57, assistant to general superintendent of **United States Steel's** Fairless Works, Morrisville, Pa., died June 20.

L. Norris Hall, 74, founder of **L. Norris Hall Inc.**, Philadelphia, in 1921 and since that time its president and treasurer, died June 21.

Frank L. Harris, chief draftsman in the engineering department of **C. H. Wheeler Mfg. Co.**, Philadelphia, died June 15.

George B. Thurston, 62, eastern manager of **Ironsides Co.**, Columbus, O., died in Middletown, Conn., June 15.

Robert MacArthur, 59, president, **Ramsey Chain Co. Inc.**, Menands, N. Y., died June 10.

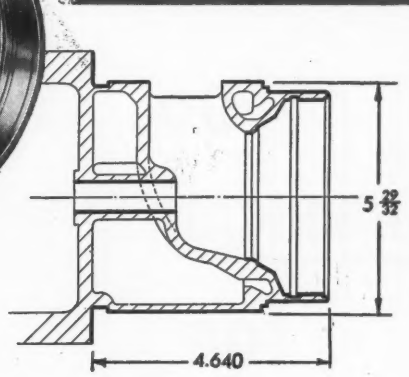
Otto Knoerzer, 86, founder and president, **Champion Corp.**, Hammond, Ind., died June 18.

William M. Costley, 56, sales manager, **Modern Handling Equipment Inc.**, Chicago, died June 19.

ALL THIS

RAPIDLY PROFITABLY AUTOMATICALLY

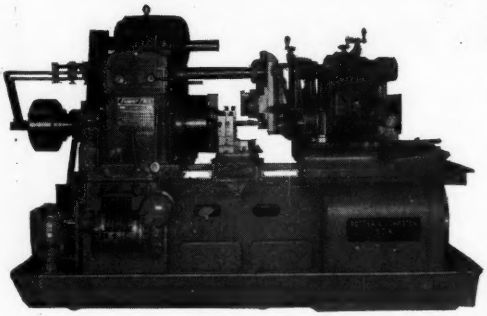
WITH A



Heavy lines indicate machined surfaces on cast iron cylinder head

POTTER & JOHNSTON 5D *Power-Flex*

AUTOMATIC TURRET LATHE



The 5D Power-Flex — like all Potter and Johnston Automatic Turret Lathes — provides the power, flexibility and automatic operation needed for high output of close tolerance parts at lowest possible unit cost. Extra rigidity and permanent alignment mean long machine life, lasting accuracy and a long-term profit on your original investment.

For high-efficiency production of cast iron components like the cylinder head shown above — today's outstanding machines are Potter & Johnston Automatics equipped with P&J Precision Tooling. Based on more than a half century of specialized experience, this combination is your guarantee of more and better work and fewer rejects.

Interested in added productivity, precision and economy? Send today for this Bulletin. Remember—P&J engineers can help with your production problems. They'll recommend best combinations of tooling and operation sequence for low cost and high output. There's no obligation.

Precision Tooling 50 Production for over years

POTTER & JOHNSTON COMPANY
PAWTUCKET, RHODE ISLAND

SUBSIDIARY OF PRATT & WHITNEY — P&J — DIVISION NILES - BEMENT - POND CO.

WRITE DIRECT OR CONTACT THE PRATT & WHITNEY BRANCH OFFICE NEAREST YOU
BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., WEST HARTFORD

GO "AMERICAN" FOR CIRCULAR WELDED PRODUCTS

If any of your requirements lend themselves to any welding process, we believe that our 34 years of welding and fabricating "know how" put to work for you will provide you with worth-while manufacturing economies. All you have to do is drop us a line.

A company you'll like to deal with

THE AMERICAN WELDING & MANUFACTURING CO. · WARREN, OHIO

Send for your copy of our 20 page illustrated catalog

LET US SEND YOU MORE FACTS OR BETTER YET SEND US YOUR SPECIFICATIONS FOR PROMPT QUOTATIONS

Production AND Engineering
NEWS AT A GLANCE

ULTRA-COLD RESEARCH —Great potential value may be derived from working with metals in frigid temperatures. Arthur D. Little Inc., Cambridge, Mass., says one experimental result is extremely hard stainless steel prepared by immersion in liquid nitrogen at minus 320° F, rolling and forging at controlled temperatures. Another promising field is application of superconductivity of certain metals and crystals at low temperatures. To date about 50 laboratories are equipped to do such work in the nation.

MIDDLEWEIGHT CHAMP—Middleweight champion of the structural metals—that's how metallurgists describe titanium. How well the champ is faring in the metals ring is indicated by the number of military and civilian bouts he's come through unscathed. Titanium alloys have good tensile strength up to about 800° F and are equal or better than stainless steel up to 750° F. Jet engine designers use titanium for parts exposed to these middle temperatures. Titanium alloys show much higher fatigue resistance than aluminum, higher even than steel. The champ is getting to be a big boy now. Producers of titanium sponge will turn out about 5000 tons in 1952. 1951 production was only 600 tons. —p. 76

KEEPS FLYING BLOWTORCH COOL—The tail pipe of a jet engine gets so hot that it would char the fuselage to a cinder if left free to radiate unchecked. But so effective is the insulation you can actually touch the outside of the ½-inch thick refractory blanket while the engine is operating. Secret that locks the blasting heat in the tail pipe is the structure of the thin insulating blanket. In one of the newest types, made by H. I. Thompson Co., Los Angeles, the first layer—the one next to the glowing tail pipe—is made of sheets of 0.002-inch polished Inconel foil. Underneath is a layer of fibrous silica batting, and beneath that a layer of specially-treated fibrous glass, all held in place by another layer of Inconel. The shiny metal reflects most of the heat, and the refractory material absorbs the rest.

INDUSTRY AID: "TAGGED" AIR—Knowledge gained from chasing "tagged" air in airplanes may come in handy for industry in preventing air pollution with factory smoke and other exhausts. The chasing was done by three scientists at the New Mexico Institute of Mining and Technology who "tagged" air with minute fluorescent pigments then followed their travels through the skies in aircraft. They discovered that a particular parcel of air as it moves through the atmosphere, scatters and diffuses into an area one million times its original size before going 10 miles. This takes about 2 hours. With this new technique the scientists were able to trace the diffusion of air for more than 100 miles, about four times as far as it had ever been done before.

COST CUTTING STILL GOAL—The Air Force is still whittling away at the overall aircraft cost picture. In response to a request from General Rawlings, technical and inspection committees of Aircraft Industries Association of America are engaged in a survey of various military specifications and regulations which might be revised or eliminated to effect savings to the Air Force in the design, development and production of all types of aeronautical equipment. A compilation of the material is expected to be submitted to the General by mid-summer, AIA says.

FEWER DIE TROUBLES—Die casters still haven't discovered a cure-all for die casting die troubles. But they do know that the right die lubricant can go a long way toward smoothing die performance. Greatest benefit from proper lubrication is its preventive maintenance feature. When a die lubricant fails, castings stick, expensive dies may be damaged or unduly worn, production interrupted. Most die casting shops are able to operate with three types of quality lubricants, classified by alloys being cast. —p. 82

GM DEVELOPS 16-CYLINDER JOB—Development of a 16-cylinder vertical radial diesel engine to be used for defense purposes was revealed before members of the SAE by Eric R. Brater of the Cleveland Diesel Engine Division of General Motors. The engine now a wood model to permit improvements is to have four rows of four cylinders. Air is to be supplied by Root-type blowers.

WASTE STEAM TO HEAT—Plant workers in an English plant literally are kept warm by the heat of the forge. Waste steam from two 5-ton steam hammers at Firth-Vickers Stainless Steels Ltd., Staybrite Works, Sheffield, is used to heat 3½ acres of plant area including offices and restaurant. This saves the company some 1200 tons of solid fuel per year and, by returning condensate to the boiler, over 4,260,000 gallons of main-supplied water are saved in the heating season. A system of applying graphite lubrication eliminates the oil normally discharged with the waste steam. Exhaust steam from the hammers is led around the plant through simple overhead pipe system, unit heaters and radiant panels. Live steam to the hammer is reduced by a device controlled by the hammer operator's weight as he steps on and off a specially designed platform.

Metalworking Outlook—p. 35 *Market Outlook—p. 117*

TITANIUM: Big Production Gains

Developments in production of titanium are rapid, with changes frequent. Output this year is expected to be about 5000 tons, nearly three times the 1951 production rate

By CHARLES A. SCARLOTT
Westinghouse Electric Corp.
Pittsburgh

TITANIUM, newest member of the structural-metals group, three years ago was almost unknown in metallic form. Because it is only a little over half as heavy as steel and has much better strength at medium temperatures than aluminum, titanium is the new middleweight champion of the structural metals.

Titanium alloys have many attractive qualities, two of special significance. Up to about 800° F, titanium alloy (titanium 95 per cent) has greater strength for its weight than any common metal or alloy. It is virtually noncorrosive in all ordinary situations—including salt water and salt air—and in many extraordinary ones.

Medium Weight—Titanium is a medium-weight metal. It weighs 0.16 pound per cubic inch (density 4.54), which makes it 1.6 times as heavy as aluminum, 2.6 as heavy as magnesium, but only 56 per cent as heavy as steel. Although pure titanium is not notable for high strength, titanium alloys are strong. Titanium alloys have good tensile strength up to about 800°F and are equal or better than stainless steel up to 750° F. Jet engine designers use titanium for parts exposed to these middle temperatures where otherwise the heavier metals would be required.

Same quality makes titanium attractive for applications where temperature is not a factor: Aircraft armor plate, electrical components, pontoons, cables, structural braces, and other fuselage members. Army engineers are interested in titanium for truck bodies, girders, portable bridges, and personnel-carried apparatus, when costs are more favorable.

Nonmilitary Uses — There are

Titanium sponge consists of hard, gray, porous lumps that are consolidated into solid ingots

numerous commercial and industrial uses, although high-tonnage ones will be few until costs drop markedly. Portable machine tools, fast-moving spindles, spools, warp beams and other moving parts of textile machinery are representative of the many places in industry where a strong but light material is advantageous.

Metallic titanium has also been used as target material in x-ray tubes, and as window material for Geiger nuclear-radiation counters. Ability of titanium when hot to absorb large quantities of oxygen, nitrogen and hydrogen, a distinct nuisance to those using titanium structurally, is put to good use in electron tubes. Titanium is added to soak up these gases as they are boiled out of the glass and other tube parts.

Titanium's unique strength is accompanied by good ductility. Titanium alloys already known in this early stage of development are far superior to all the usual engineering metals and alloys in strength-weight ratio. Titanium is the only structural metal known to have an endurance limit consistently in excess of 50 per cent of its tensile strength.

Titanium alloys have shown much higher fatigue resistance than aluminum, higher even than steel. They are harder than aluminum and approach the highly alloyed steels. Surface hardness comparable to nitrided steels is obtainable. Titanium has low linear coefficient of expansion and low thermal conductivity.

Corrosion Resistance—Titanium possesses an anomalous set of corrosion characteristics. It is an inherently reactive metal. Yet one of its greatest fields of application will be opened by its ability to resist corrosion. As a self-protecting metal, titanium is best known for its indifference to sea water.

This property suggests many marine applications. There are lightweight piping systems handling salt water, condenser tubes operating with high water velocities, plumbing fixtures, pump rods and rotor shafts. In resistance to moist chlorine gas titanium is superior to all other ordinary materials. Curiously, titanium burns in dry chlorine gas. An important feature of the behavior of titanium in nitric acid is that it retains its good resistance to attack even when the temperature and pressure are raised. Other materials such as stainless steel, that are resistant to boiling acid at atmospheric pressure are attacked severely when hot and under pressure.

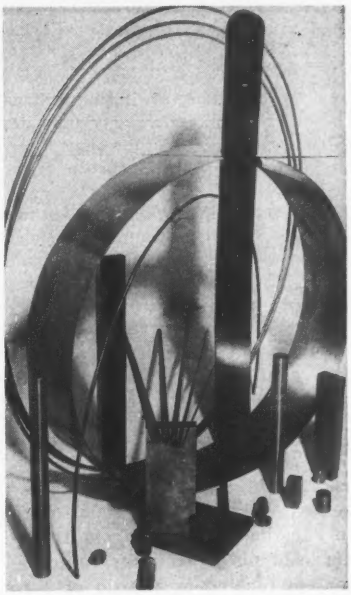
Corrosion studies with various foods, such as pineapple juice, cider vinegar, lard, tea, coffee, grapefruit juice, and lactic acid show no attack on titanium. This opens the door for its use in food-processing plants and restaurants when and if its cost declines.

High-Temperature Behavior — Pure titanium melts at a high temperature, 3140° F, (stainless steel melts at 2550) which suggests that it is a high-temperature metal. But it isn't—for two reasons! By absorbing oxygen and nitrogen a titanium alloy increases in surface hardness and loses strength rapidly at temperatures above 1000° F.

Where It Comes From—Titanium-bearing ores are plentiful and widely scattered about the world. United States is amply endowed. The principal titanium ores are rutile, ilmenite, arizonite and titaniferous magnetite. Rutile is dioxide titanium (TiO_2) in which titanium (metal) comprises 57 per cent of the compound. Ilmenite is titanium in combination with iron and oxygen ($FeTiO_3$) in which titanium is 32 per cent of the total. Arizonite is $Fe_2O_3 \cdot 3TiO_2$, with titanium 36 per cent of the total. The titaniferous magnetite is a complex compound, also with iron, $FeO(FeTi)_2O_3$, and usually has a titanium content of 6 per cent.

Rutile, the simpler and much more desirable ore for titanium recovery, is the smaller supply. The tiny reddish brown to black particles that can be seen, usually in trace amounts, on the sands of most beaches, are rutile, ilmenite, and arizonite. The world's principal deposits of rutile are in Australia, Brazil, and in Florida near Jacksonville and Vero Beach.

Piney river district of Virginia has a large occurrence of rutile but the grade is low. Large deposits of rutile and also other titanium ores also occur in Arkansas. However, rutile is in short supply, particularly with our constantly increasing appetite for the metal.



Once in ingot form, titanium can be converted to a multitude of shapes using standard fabricating methods

While most of the titanium metal is produced at present from rutile, it is recognized that production of the metal will soon have to be based on the other and more plentiful ores or on titanium-rich slags. Ilmenite deposits are enormous. Deposit in the Allard lake region of Quebec tops them all. This whopping deposit is being developed by Kennecott Copper Corp. and New Jersey Zinc Sales Co.

When diamond drilling ceased at 300 ft, a deposit of more than 100 million tons, averaging about 82 per cent combined iron and titanium oxides, had been outlined. Other ilmenite deposits measured in tens and hundreds of million tons occur in Japan, India, Norway, and Russia. Principal body of ilmenite ore now being exploited in the United States is at Tahawus, N. Y., owned by National Lead Co. It is estimated as containing well over 100 million tons. At Iron Mountain, Wyo., is a 40-million-ton reserve of titaniferous magnetite.

Production of Titanium—Production of titanium from even the simpler ore—rutile—is not easy. Rutile sells for about six cents a pound, titanium sponge for $5 per

FROM ORE TO TITANIUM

Production of ductile titanium from titaniferous ores is still undergoing rapid development. Changes are frequent, but the steps shown here are representative of present practice of winning titanium from rutile.

Sands in Florida and Australia are dredged and processed by water flotation or other mechanical means to obtain an approximately 90 per cent rutile (TiO_2) concentrate. On exposure to hot chlorine gas in the presence of carbon the tiny black grains of rutile are converted to titanium tetrachloride vapor, which is condensed to a liquid and sent to a batch-type heat-resistant steel reactor. In an inert-gas atmosphere (generally helium), the tetrachloride reacts exothermically with magnesium to produce liquid magnesium chloride and sponge titanium.

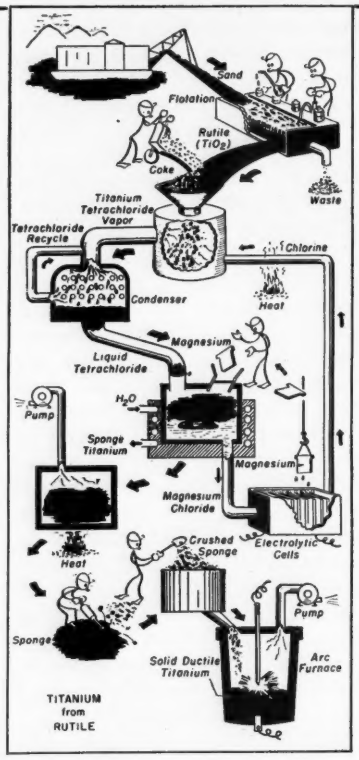
Magnesium chloride is drawn off to electrolytic cells for dissociation into magnesium and chlorine for reuse. The metal crucible, with titanium sponge and absorbed magnesium chloride and unutilized magnesium, is removed and heated to drive off the magnesium and magnesium chloride. Sponge is chipped out, crushed, and fed to an inert-gas arc furnace with walls of water-cooled vapor. There it melts and solidifies as a solid ingot suitable for forging. This, too, is a batch operation although arc furnaces have been developed to produce continuous ingots.

pound, the structural forms for $6 to $15, base price. (From titanium content of concentrate to titanium forging is a ratio of 1 to 50: for iron it is 1 to 3; for aluminum. 1 to 12.)

Problems that must be lived with in producing titanium are formidable. The liquid metal appears to be a universal solvent or a good reducing agent. It either dissolves or is contaminated by any known refractory. The metal has to be won from its ore with extreme purity, for the contaminants, mainly oxygen and nitrogen, that would come along are ruinous to the metal's physical properties.

Metal when molten is so active chemically, absorbing oxygen or nitrogen from the air with such ruinous rapidity, that all extractive and ingot-melting processes must be carried out either in vacuum or under the protective blanket of an inert atmosphere. As a further complication, any trace contaminants picked up along the way cannot subsequently be removed from the metal by any technique yet announced.

Present processes for producing titanium sponge are of the batch type. Sponge consists of hard, gray, coke-like, porous lumps, which must be consolidated into solid ingots for production into titanium forgings or rolled or drawn shapes. This is done by melting in an electric furnace, protected by a blanket of argon or helium. Most production is achieved by batch methods although du Pont has successful continuous furnaces in operation.



Starting with the process developed by the Bureau of Mines, commercial firms have made great strides in the techniques of raw titanium alloy production. Melters and fabricators, have made similar advances.

Obstacles to production of large ingots on a commercial basis seemed insurmountable. But these have been surmounted to the point that ingots up to almost a ton in size are regularly produced. Further great improvements can be expected. Horizons Titanium Corp., a Horizons Inc. and Ferro-Enamel Corp. combine, is reported to have a new, low-cost, electrolytic process and has built a pilot plant in Cleveland to test the method.

Fabrication Standard—Once titanium has been produced in ingot form rolling, drawing, and forging operations are performed with essentially standard techniques. Machining of higher carbon grades has presented exasperating problems. These result from the tendency of titanium to work harden. to gall or pick up on the tool. Galling characteristic of titanium touches on another interesting property—its ability to leave a mark on glass when rubbed across it.

The Industry Today—Two largest producers of titanium sponge are Du Pont and the Titanium Metals Corp. A third firm, the Crane Co., Chicago, turns out a small quantity. The three in 1951 produced 600 tons of titanium sponge. By the end of the year production was at the rate of 1400 tons per year. Output in 1952 will be more like 5000 tons.

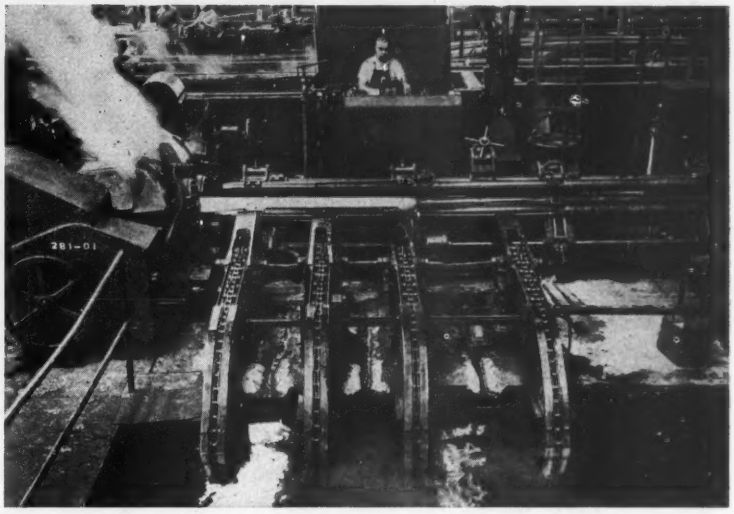
Several firms convert titanium sponge to ductile titanium and produce forgings of rolled or drawn shapes. These include Allegheny Ludlum Steel Corp., owner with National Lead Co. of Titanium Metals Corp.; Rem-Cru Titanium, Inc., a company formed by Remington Arms Co., a Du Pont subsidiary, and Crucible Steel Corp.; Republic Steel Corp., and Mallory-Sharon Titanium Corp. (P. R. Mal-

lory & Co. Inc. and Sharon Steel Corp.)

Another important use of titanium is as rutile coatings for welding rods. Rutile greatly increases arc stability. In the last years this has amounted to about 9500 tons TiO_2 per year.

Titanium is an important alloying agent for steels. It is added as ferrotitanium, not as metallic titanium. This usage took about 5000 tons and 7700 tons equivalent TiO_2 content in 1950 and 1951, the bulk of it coming from ilmenite. In steel, titanium is a deoxidizer and scavenger, and in stainless steel is a carbide stabilizer.

More recently titanium has been added also to low-carbon steel because of a carbon-stabilizing effect. Steel or iron of high purity, with all of the carbon combined with titanium, can be given a satisfactory smooth white vitreous enamel coating (without blisters or black specks) without the use of a ground coat by fusing a single layer of almost any good white enamel on it.



Heated Billet to Quenched Tube: One Minute

Copper tube cast in solid billets gets its first processing in this piercing machine at Chase Brass & Copper Co., Waterbury, Conn. Billets have 3 to 9-inch diameters, weigh up to 1000 pounds. Operator guides the process from heated billet to quenched rough tube in less than a minute without leaving his seat

Tiny Bulb Output High

Military plane bottleneck threat removed by automatic method that steps up lamp production

ELIMINATION of a potential bottleneck in military aircraft production through a major development in lamp bulb manufacturing techniques was disclosed by General Electric's Lamp Division, Cleveland.

After more than two years of research, a method has been devised to manufacture on automatic machinery a tiny lamp bulb which the nation's expanding air forces are requiring by the millions.

Hand Made—Until recently the bulbs were constructed by hand. Workers used ten-power magnifying glasses to assist them in assembling the parts. Even with this aid, only one worker in ten was found able to do the job successfully, according to GE.

The miniature lamp is used to illuminate hundreds of instruments and controls in the modern military plane. It is so tiny that its glass globe is little larger than the head of a kitchen match.

Rated at 28 v, the lamp's construction is extremely complex, for into the tiny bulb must go two lead-in wires, two support wires, and a long, fine, coiled-tungsten filament. Like other very small incandescent lamps, the glass bulb contains a vacuum.

Foresighted Planning—When it appeared likely that these miniature light sources would be in great demand by the Air Force and the Navy's air arm, GE engineers began to investigate the possibility of speeding up production.

At first, many were convinced that the lamps could not be produced by automatic machinery. However, it was decided that the effort to attempt automatic production was worth while.

Hundreds Used—The lamps are used by the hundreds in nearly every military plane, and by the use of automatic machinery GE was able to maintain production sufficient to meet increasing military requirements.

The average fighter plane employs 150 to 350 of the bulbs, while approximately 640 of them have been counted on a modern Navy patrol aircraft. From two to four lamps are used to illuminate each dial evenly and uniformly.

As a result of the changeover from manual to automatic production methods, GE has been able to effect a saving to the air forces of from $10 to $25 per plane for one set of lamps.

Underwater Welding Reviewed

Underwater welding is still a technique to be used only in special cases, and in which safety precautions are a major factor. These are points emphasized in a manual describing the technique, published by Office of Technical Services, Washington.

Limits to application and safety precautions necessary are described thoroughly in the report. In addition, equipment, supplies and accessories are listed. Table of current values for different types of electrodes and drawings for a special electrode holder needed in underwater work are also included.

Text considers the following phases: Choice of electrode size; underwater weld strength; fitting up; surface cleaning; adverse conditions; fillet techniques in vertical, overhead and horizontal work; and safety measures. Other topics deal with application of underwater welding to repair cracks and attachments of pad eyes; and underwater metallic arc cutting.

Metal core being inserted into rubber platen. Air stand includes a tube partly expanded by compressed air at one end to permit initial entry of the core

Air does the trick here—it ejects small parts from the stamping press at the rate of 150 to 1000 parts per minute, depending on the size and weight of the part

COMPRESSED AIR DOES IT

Adding Machine Parts Handled Faster

IN EVERY industry, there exists the possibility of substantial savings through the use of compressed air operated mechanisms. Many alert manufacturers have investigated this power source, and have devised methods of performing operations which heretofore have been accomplished by outmoded, expensive, and time consuming means, usually manually.

Burroughs Adding Machine Co., Detroit, for example, has come up with several applications which on exploration may stimulate the conception of similar applications to other purposes.

No More Forcing — Inserting metal cores into the platen of a business machine posed one problem. The old method of putting a coat of shellac on the core, then manually forcing it into the rubber tube was slow and fatiguing.

Burroughs remedies this situation by devising a special air stand. It includes a rubber tube which is expanded at one end to permit the core to be partially inserted. Air is then admitted and the tube expanded along its entire length to permit complete insertion. This new method more than doubles the output of this production area.

Air Does the Ejecting—Efficient parts ejection is important to production volume. To handle ejection of small machine parts being stamped out on a press, Burroughs set up air lines so jets of air can be made to eject the part. Depending on the size and weight of the part, from 150 to 1000 parts per minute can be ejected.

In the case of oiling and drying of desk model machines, another rather unusual application of compressed air proved useful. It involves an oil reservoir and cleaning tank.

The oil is forced by air from the reservoir to the cleaning tank until the machines are completely submerged.

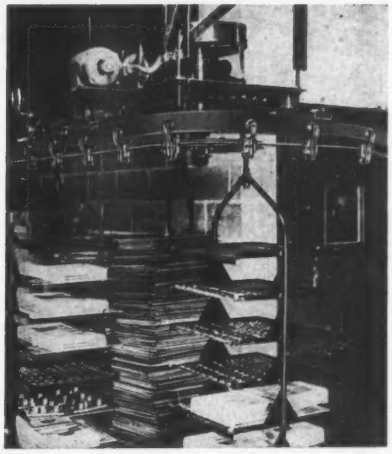
No Splashing — Fifty gallons of oil are transferred from the reservoir to the tank in 7 seconds without splashing. When the air pressure is released, gravity feed returns oil through a filter to the reservoir. After oiling, the machines are dried by spinning at approximately 300 revolutions per minute.

These are the more unusual applications of compressed air at Burroughs. Actually the company makes rather extensive use of air.

Other Uses—Air agitation is employed to keep silica powder suspended in liquid on wet blast machines. Air jets are used for cleaning, especially chips from production tools, filters, etc. Drying in cleaning and plating rooms is by compressed air. Screw and grinding machines employ air chucks. Conveying tubes between buildings act on the vacuum technique. Air cylinders operate plungers of die casting machines.

Oil transfer to tank containing desk model machines is accomplished by air pressure. Fifty gallons of oil goes from reservoir to tank in 7 seconds

Chime parts carried alongside spray booths by cable conveying system. Overhead system frees floor space



Close-up showing details of conveyor and racks. Drive unit with variable speed changer is at 90 degree turn

SAME AREA, MORE WORKING CAPACITY

Overhead Conveying Frees Floor Space

WHEN YOU'RE cramped for production space, you can do one of two things: Either put on an addition or "take to the air."

Nutone Inc., makers of door chimes, ceiling heaters and ventilating fans, did the latter. When the Cincinnati company went to a straight production setup, a whole new concept of parts handling had to be devised. The solution:

An overhead trolley cable conveying system that nearly doubles the working capacity of the plant floor area and permits live working storage of parts.

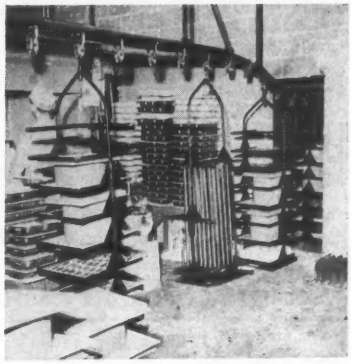
What Was Needed — The basic handling problem was one that required the efficient handling of large volume, proper transit-speed of moving parts, and perfect timing in paint spraying and baking of dissimilar parts. In order to level out production peaks and valleys, door chimes constitute the greater portion of the production run during the last half of the year, whereas ventilating fans and ceiling heaters constitute the production run during the first half of the year.

Since two 8-hour shifts are capable of processing 50,000 to 60,000 parts daily, extremely large volume is in itself a parts handling problem. Added to this at any given time there may be four to six different types of units being processed at the same time, each unit requiring an entirely different color of finished paint spraying. To further complicate matters, paint baking periods had to be timed accurately.

The Old Way — The old method of parts handling consisted of moving components from one operation to another on standard bakery type trucks. This was cumbersome, jammed aisle space and took an excessive amount of production space and manual handling time.

The new setup, devised by the plant manager working with Kirk & Blum Co. engineers, uses an overhead trolley cable conveyor system produced by E. W. Buschman Co. Being entirely overhead, it made possible an increase of 50 per cent in the number of paint spray booths, and the whole operation is now a continuous process. Manual handling is negligible since only one man is required to keep the conveying system completely stocked.

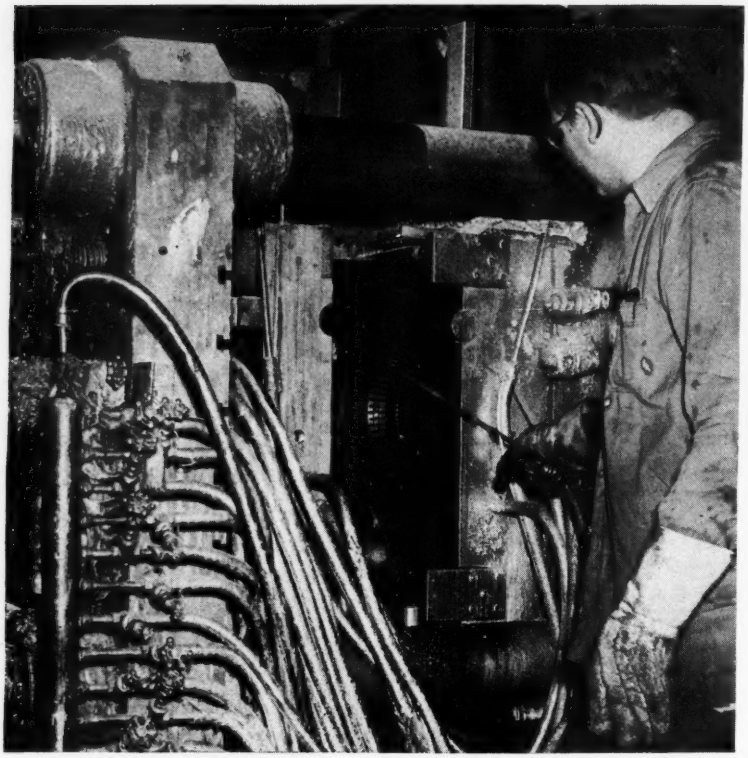
What Makes It Work—For mobility, the system makes use of pressed steel ball-bearing wheels of 80-pound capacity. As seen in the accompanying illustrations, the trolley castings are split and bolted to the ¼-inch cable with an offset grip action so there is no slip under load.



Racks entering overhead baking oven from spray room. Trays are stacked eight high on 48-inch center, with intermediate trolleys for the parts

Both brackets and wheels are removable, independent of the casting bolts. Hooks are attached to the lower portion of the trolley. The track itself includes lugs welded on 6-foot, 8-inch centers to permit bolting on vertical hangers and braces. The trolleys are spaced a foot apart.

At one point the system runs through a convection type high temperature baking oven with automatic temperature control. The conveyor speed times the back-and-forth travel of the conveyor inside the oven. Automatic oiling devices insure free-running wheels.



Simple "blowpipe" method is employed to lubricate large die cavity. It disperses the lubricant thoroughly and blows out any excess simultaneously

By V. W. SMITH
President
G. W. Smith & Sons Inc.
Dayton, O.

NO CURE-ALL FOR DIE CASTERS BUT

Die Lubricants Smooth Performance

No lubricant can solve all die problems, but a good one can act as a corrective agent to produce good work if die or operating defects are not too serious

WHAT'S THE best die lubricant for die casting?

The answer is easy. There isn't any. No lubricant is a panacea for all the die problems of a die caster.

Proper die design and construction is of first and paramount importance for successful operation. Improper gating and venting of the die, insufficient draft for good ejection of the casting, improper die or metal temperatures, faulty injection pressures, are some causes of major trouble which cannot be completely solved with a die lubricant.

But It Does Help—It's true that in many borderline cases where die or operating defects are not too serious, the die lubricant frequently acts as the corrective agent and enables satisfactory production. There are many instances where a high quality die lubricant proved profitable in turning out castings impossible to produce with inferior lubricants because of insufficient draft or other die defects. Good lubrication often permits faster production rates with a minimum of rejects.

Greatest benefit from lubrication is its "preventive maintenance" feature. When a die lubricant fails, castings stick, or expensive dies are damaged or unduly worn, and production is interrupted. The end result: Expensive down-time.

What It's For—Main purpose of die lubricant is to prevent wear, galling of die parts, eliminate sticking of the casting in the die and insure easy ejection. It also provides several secondary functions. For example, it acts as a cooling agent on the die cavity surface, provides an inherent coating that reduces surface tension permitting better metal flow and easier fill-out of the casting, protects die surfaces from errosive effects caused by the wash of incoming molten metal, prevents welding of molten casting alloy to the die cavity surface. To some extent it acts as an insulator in preventing too rapid dissipation of the heat from the casting alloy.

Where Used — Three principal sections of the die casting mechanism require lubrication: Die cavities; moving die sections such as sliding cores and the ejector pin mechanism; and the injection plunger or piston, especially on cold-chamber machines. In all three, the lubricant serves mainly to prevent seizure, galling and wear.

For maximum results, no one lubricant has yet been developed that can be used universally for all die casting jobs. One can readily understand this because of the different types of alloys cast and varying metal and die temperatures necessary in each case.

For instance, molten zinc is cast at about 900° F in a die heated to between 350 and 450° F; whereas aluminum is cast at about 1200° F in a die maintained at a temperature of 500 to 600° F.

Versatility Doubtful—A lubricant designed to operate satisfactorily at zinc casting temperatures very probably will not be suitable at the higher casting temperatures of aluminum, magnesium or brass.

However, the converse may also be true, a point frequently not recognized. A die lubricant highly successful for aluminum or brass die casting, may prove entirely unsatisfactory when used for making zinc castings. A good aluminum casting lubricant will not be consumed rapidly enough at the

FLAT SPRING STEEL

No more waiting! Roebling's expanded facilities can meet your needs right now!

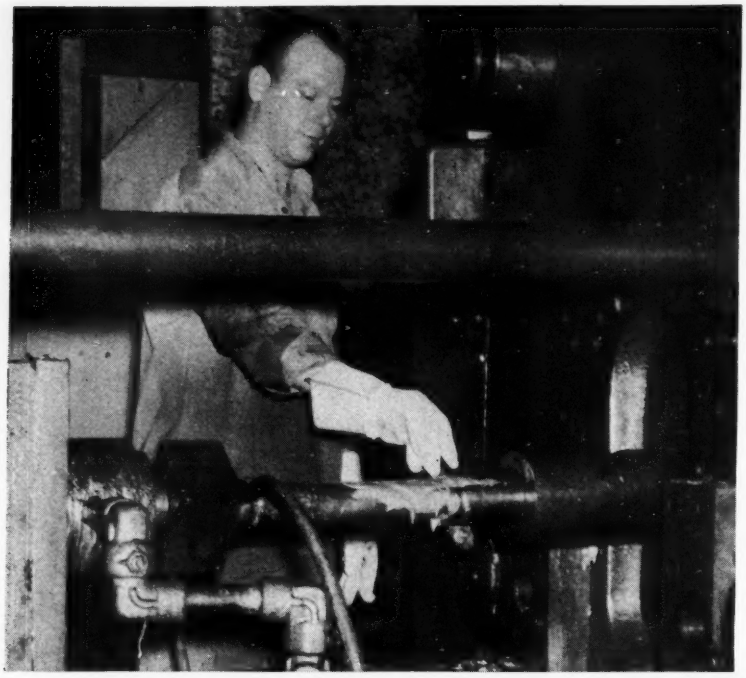
PROMPT! FAST! . . . that's the sort of deliveries you can count on now for Roebling high carbon flat mechanical spring steel. For many years Roebling has had one of the largest specialty mills in the country and today's expanded facilities have boosted production to new highs.

Roebling flat spring steel is made as you want it . . . annealed, hard rolled untempered; scaleless tempered; tempered and polished, blue or strawed. And from open hearth to finished product, Roebling positive control assures uniform quality . . . saves preparation time for users . . . brings faster, smoother production.

Roebling is ready to furnish flat spring steel with the exact mechanical properties required for any special type of application. Write or wire now for full information. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Avenue ★ ***Boston,*** 51 Sleeper Street ★ ***Chicago,*** 5525 W. Roosevelt Road ★ ***Cincinnati,*** 3253 Fredonia Avenue ★ ***Cleveland,*** 701 St. Clair Avenue, N. E. ★ ***Denver,*** 4801 Jackson Street ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Boulevard ***Los Angeles,*** 5340 E. Harbor Street ★ ***New York,*** 19 Rector Street ★ ***Odessa, Texas,*** 1920 E. 2nd Street ★ ***Philadelphia,*** 230 Vine Street ***San Francisco,*** 1740 17th Street ★ ***Seattle,*** 900 1st Avenue S. ★ ***Tulsa,*** 321 N. Cheyenne Street ★ Export Sales Office, Trenton 2, N. J.



A heavy, grease-like lubricant prevents sticking and scoring of the plunger on cold chamber die casting machine. Photos courtesy Electric Autolite

relatively low zinc casting temperatures.

As a result excessive die lubricant will be pocketed in the die cavities, which in turn, causes stains, surface swirls, cold shuts and similar blemishes on the zinc casting.

Defects such as these are highly objectionable in subsequent finishing and plating operations. They may even lead to rejection of many castings where a hardware finish is required. Of course, if the zinc casting is not to be plated and surface finish is of little importance the same lubricant can be used as for the higher melting point alloys.

Requirements Higher—Generally speaking, actual lubrication requirements for aluminum, magnesium and brass casting are much more severe than the zinc casting; whereas zinc casting lubricants must be selected with special attention to their effect on surface finish.

In choosing a die lubricant it is best to find one which can be used effectively on all parts of the die including cavities, slides, cores and the ejector mechanism. Using two or more lubricants on the same die is highly inefficient and slows down production rate.

Not Many Needed — Most die casting shops should be able to operate efficiently with three types of quality die lubricants, classified by alloys being cast, as follows: Zinc castings (plated or unplated), or lead; aluminum, magnesium, or unplated zinc castings; brass castings.

A fourth, the plunger lubricant, is very important to those operating cold-chamber die casting machines for aluminum, magnesium and brass castings. With this type of equipment, the molten casting alloy is ladled through a well or hole in the top of a chamber or cylinder. The plunger then moves forward through the cylinder forcing the liquid metal under great pressure into the die. The plunger must fit snugly in its pressure chamber to keep the casting alloy from by-passing. When this occurs much of the applied pressure is lost and the solidified metal trapped between the plunger and its cylinder wall causing the plunger to stick. Adequate lubrication therefore is vital.

It Also Protects—The lubricant film also protects the plunger and cylinder walls from attack by the molten casting alloy. Plunger lubricants are heavy, viscous oils or grease-like materials usually containing graphite.

A proprietary plunger lubricant developed recently is reported to lubricate effectively for five to seven times as many casting cycles as with graphited oils and greases. It is also claimed to be a very clean lubricant which will not stain the casting alloy.

Many die casting departments in the past relied on their own homemade lubricants. It was not unusual to find large die casting shops with as many as 20 different lubricating mixtures in stock, accumulated over a period of years.

Intentions Good—Many if not most of these lubricants were developed by the die casting operators in the course of their trade. Oftentimes when a new operator is hired he brings to his foreman one or more of his own pet formulas claiming he must use them for best results and top production.

Since the die casting process can still be defined as an art comprising many variables, and since every casting job is different, it is only natural that opinions may vary radically on what lubricants should be used.

Some of the materials used include lard oil, palm oil, cocoa butter, stearic acid, beeswax, carnauba wax, tallow, potassium bromide, oil-graphite mixtures, oil-iodine mixtures, molybdenum sulphide, various mineral oils and greases.

Could Mean Headaches — Although these materials might serve on some jobs, in every case they have disadvantages which eliminate them as ideal die lubricants. For instance, no bromide should be used to cure a die headache because it corrodes both the die surface and the casting. Iodine is a dangerous material to apply to an expensive steel die. Animal and vegetable oils and waxes tend to oxidize rapidly at elevated temperatures, leave considerable carbon and gummy residues on the die surfaces.

Graphite and molybdenum sulphide are good high-temperature lubricants, but being black in color they tend to stain the casting. Graphite also leaves a carbon residue in the die which builds up and

*Necessary...**

says Logansport Machine Company

for high pressures and fast cycles

. . . and other leading manufacturers of hydraulically operated machines agree! To prevent harmful temperature rises in hydraulic fluids, it's Ross Exchangers for positive protection!

For controlling heat generated by the high pressures and fast cycling operations of its power units, the Logansport Machine Co. uses Ross Type BCF Exchangers. Without this protection the hydraulic oil would overheat, causing pump slippage through oil thinning, thereby reducing pump capacity . . . possibly resulting in slowdown or even shutdown of operations.

Most builders of hydraulic equipment, with reputations at stake, prefer Ross Type BCF Exchangers to protect their own good names—to safeguard their machines from the effects of uncontrolled heat.

Performance proved, built from durable copper and copper alloy materials, Ross Type BCF Exchangers can be depended upon for long, hard service. Pre-engineered and completely standardized, they are available from stock.

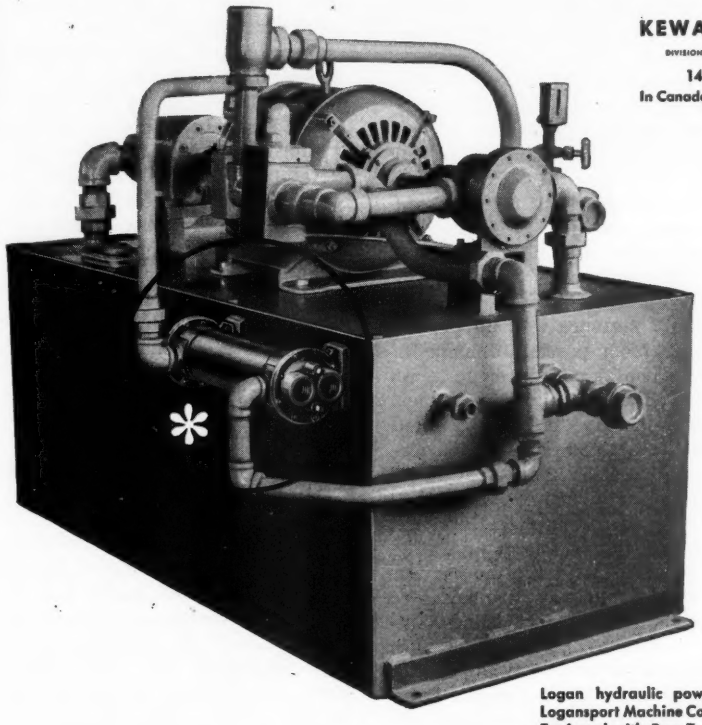
For complete data ask for new Bulletin 1.1K5.

KEWANEE-ROSS CORPORATION

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

1431 West Avenue, Buffalo 13, N. Y.

In Canada, Horton Steel Works, Limited, Fort Erie, Ont.



Logan hydraulic power unit, manufactured by Logansport Machine Co., Inc., Logansport, Indiana. Equipped with Ross Type BCF Exchanger.

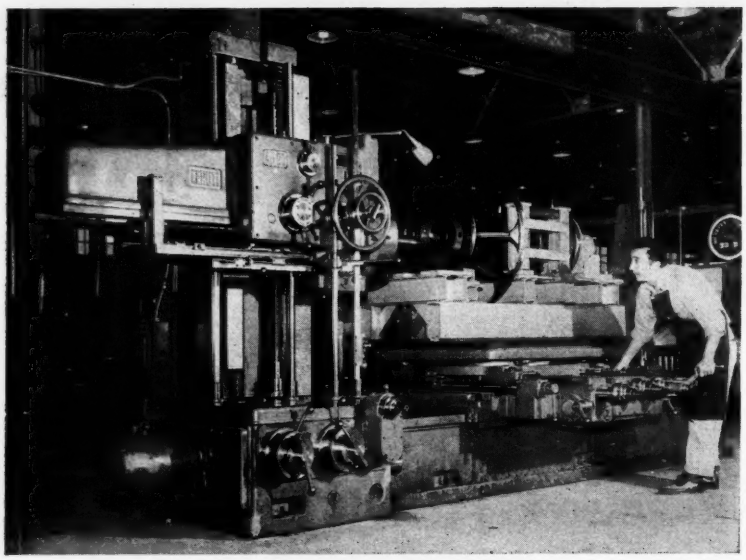
ROSS

EXCHANGERS

KEWANEE-ROSS PRODUCTS

Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON



Air Force Gets Interest from This Loan

Tool shipped from Italy to San Diego, Calif., is helping Solar Aircraft Co. produce jet engine assemblies. Solar received the Ceruti boring mill on loan from the Air Force to make J47 parts until other tools, now on order, are delivered. Precision horizontal machine has a bed that measures 74 x 40 inches

necessitates frequent die cleaning and maintenance. Any mineral oils found suitable for lubrication should be of the highly refined type and contain oxidation inhibitors.

Other disadvantages of home-made die lubricants are: Nonuniformity of product, and lubricants that appear satisfactory to the operator from a production standpoint may cause surface defects on the casting that make subsequent finishing or plating operations more difficult or unsatisfactory.

The Best Policy—Today, the basic deterrent to the policy of using home-made lubricants is the fact that production-tested proprietary lubricants are available from reputable firms who specialize in the manufacture of die casting die lubricants. They are produced under rigid standards of uniformity, quality and laboratory control.

Die lubricant performance depends in great measure on its proper application and the good judgment of the operator. For instance, frequency of application depends entirely on the type of alloy being cast, size and complexity of the casting, condition of the die, amount of draft allowed for ejection and the volume of metal being cast per cycle.

Anywhere from 10 to 50 casting cycles can be made between applications in producing the average zinc casting. With the higher melting point alloys a good lubricant is usually applied after every three to ten cycles for average castings.

Tip for a New Die—When a new die is being tried out the lubricant is applied copiously to all parts of the die after each shot until it is definitely determined that the new die is operating properly. This is a safety measure to help protect the die from possible damage in event some error was made in its design or construction. The amount of lubricant is gradually reduced until the minimum amount for adequate lubrication has been attained.

A cardinal principle in die lubrication is to use no more lubricant than absolutely necessary. Too much lubricant in the die cavities usually causes excessive gases to be trapped instead of being vented from the die. Castings with structural defects such as porosity may result. Likewise excess lubricant leads to stained castings, cold shuts, surface swirls and similar marring of surface finish.

The device used to apply lubricant is therefore very important. A brush or swab is far from ideal as it usually means application of excessive lubricant and leads to general waste. Various spray guns are used with some success but many are difficut to handle.

What Not To Do—One method not recommended, is to pour a small amount of lubricant in front of the plunger tip where cold-chamber machines are being operated. The plunger forces the lubricant ahead of the molten casting alloy into the die. With this method most of the lubricant is rammed into pockets at the back of the die cavities causing stained castings and perhaps entrapment of the excess gases upon combustion of the lubricant.

The most simple and efficient gadget devised and which today is used by a large number of die-casters is the "blow-pipe". Anyone can readily assemble such a device. It is made by attaching a convenient length of ⅜-inch copper tubing to a suitable valve such as a pushbutton valve, the latter in turn being attached to the air hose.

The open end of the tubing is usually bent at a slight angle for easier application. This end of the tubing is dipped into the container of lubricant, and the lubricant that clings to the inside of the tubing is then blown into the die. The follow-up of air pressure enables the operator to disperse the lubricant thoroughly and to blow out of the cavities any excess lubricant. Amount of spray applied is easily regulated by the depth to which the tubing is dipped into the can of lubricant . . . or by using a tubing of greater or smaller diameter.

Gaging Methods Shown

Full color, 16mm sound film illustrates the practice of "Gaging for Profit." Sponsored by Federal Products Corp., Providence, R. I., the movie runs about 38 minutes.

Film shows practically all known modern methods of gaging for the control of dimensional accuracy. Included are: Mechanical types or dial indicators and dial gages; electro-mechanical, air gaging, automatic sorting gages and continuous measuring gages.

Company says it will loan the film for one and two-day showings without charge to manufacturers interested.

4-HIGH REVERSING COLD MILL

Designed and built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT . NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO • LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE • STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

How to shackle this steel production thief

EXCESSIVE down-time in open hearth steel furnaces—a costly thief of steel production—can be shackled by Permanente 165 *periclase* ramming mix.

Patented Permanente 165 bonds itself to *full depth* by means of crystal-bridging. A ceramic bond begins forming at temperatures as low as 1500°F. Thus a deeper bond is obtained at normal burn-in temperatures—with no formation of fluids.

Permanente 165 *retains higher refractoriness* during long campaigns. Accurately-sized, preshrunk sea water magnesia periclase grains insure *high density.*

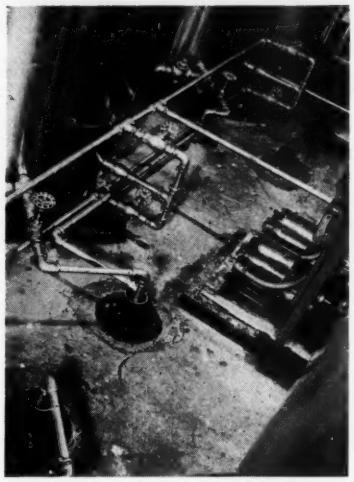
As a result, Permanente 165 gives you a dense, highly refractory bottom of high hot load strength that minimizes breakthroughs. And down-time for repairs between heats is cut to a minimum. This means increased production time, increased tonnage per year.

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 165 and on the companion ramming mix, Permanente 84. Principal sales offices: *Chemical Division,* Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

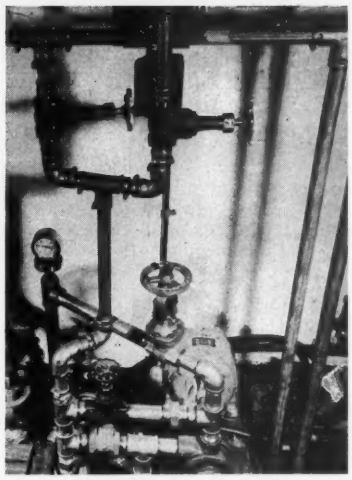
Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase



Easier assembly with these fittings reduced time and labor 40 to 50 per cent when this line was installed at Precision Film Laboratories Inc.



Corrosive solutions for developing film are kept at a temperature of 68 to 70° F. About 730 Quikupl fittings were used in this installation

NO THREADING OR WELDING

New Fitting Makes Fast Couples

A QUICK-COUPLING stainless steel fitting, a new coupling designed to reduce assembly costs, and to permit use of less expensive, lighter wall stainless steel tubing for both new construction and replacement is announced by Peter A. Frasse & Co. Inc., New York and Cooper Alloy Foundry Co., Hillside, N. J.

Chief advantage of the new fitting, referred to as Quikupl, is that it can be joined to tube or pipe without threading, flaring, sweat-soldering, brazing or welding. Pipe or tubing is simply cut to length, deburred and inserted in the fitting. The coupling is completed by merely tightening a small screw.

No Threading—By eliminating the need for threading, users of stainless steel tube or pipe escape the extra cost of heavy walls formerly required to take threads for screwed fittings, the companies state.

Peter A. Frasse distributes the fittings from warehouse stocks, and Cooper Alloy manufactures them.

The fittings, which are made to resemble standard elbows, tees, ells and other universal shapes, are in the 150 psi class with a safety factor of 6. They have a pressure stress of 900 psi, and are free flowing, retarding turbulence and pressure drop. At present, they are made in AISI types 304 and 316 stainless steel.

One Tool Needed—Assembly of the new coupling is very simple. Only one tool is required—a simple hex wrench—to tighten the clamp which is an integral part of each fitting. Inside the fitting is included a synthetic sealing ring held by a groove machined into the bore.

The seal is constructed so it will provide and maintain a squeeze fit regardless of commercial tube or pipe tolerances. Design of seal is such that pressure in the line, from either direction of flow, jams it into positive fit.

Widespread application of the new fitting is expected in the chemical processing, textile processing, photographic and oil refining industries. It also is expected to find numerous uses in the food, drug, paper and pulp, refrigeration, power generation and marine fields.

Taconite Piercing Speeded

Primary blast hole machine raises hard taconite piercing rate up to ten times

ANOTHER STEP toward large-scale mining of Mesabi taconite ores was taken recently when the newest model jet-piercing machine arrived at Reserve Mining Co., Babbitt, Minn. The new primary blast hole machine, called JPM-3, will make possible piercing of blast holes in hard taconite beds up to ten times faster than is possible with existing equipment.

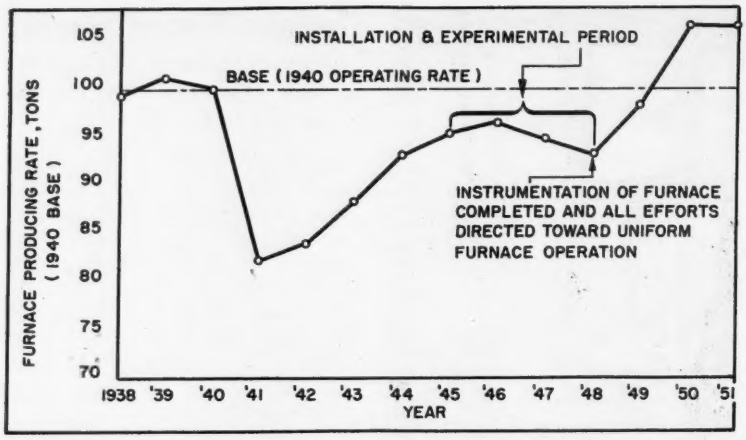
Manufacturer, Linde Air Products Co., division of Union Carbide & Carbon Corp., says the machine is the successor to model JPM-1. Improvements designed for JPM-3 are the result of extensive experimental piercing performed on the earlier model machine since 1949. Size of primary blast holes that can be pierced is increased from a nominal 6½-inch diameter and 35-foot depth, to 7½ inches diameter and to depths up to 47 feet.

Controlled Progress—Development has progressed to a point where 7½-inch holes can be pierced at about the same speeds as 6½-inch holes were finished previously. Piercing progress is controlled automatically in the JPM-3 by electronic blowpipe descent controls.

The 40-ton piercing machine is compact and self-propelled, capable of moving from one location to another with its 64-foot blowpipe mast in a vertical or horizontal position. Power, oxygen and cooling water lines trail from the rear. Spotting is accomplished by electric steering; leveling by hydraulic jacks.

Disintegration of Layers—Basically, jet-piercing takes advantage of energy available from combustion products of oxygen and a liquid fuel such as kerosene. Jetting from a burner at speeds of about 6000 fps, the flame is used to disintegrate layers of spallable rock. Burner is cooled by water, which is then directed through orifices around the burner's periphery. Changed to steam, water carries spallings out of the hole.

Equipment used in jet-piercing consists essentially of a tractor-mounted blowpipe with provisions for rotation and descent.



Operating rate at open-hearth shop covering a 13-year period. The decline in tonnage from 1940 to 1941 is attributed largely to an expanded operation, inexperienced help and a marked change in type of scrap available

INSTRUMENTATION
Improves Quality of Finished Product

Unbiased information afforded by instrument controls permits an accurate evaluation of the metallurgical process at the open-hearth shop and finishing mill

By L. W. HEINZINGER
Bethlehem Pacific Coast Steel Corp.
Seattle

CONSIDERABLE improvement in open-hearth furnace operation at Bethlehem Pacific Coast Steel Corp., Seattle, can be attributed in part to instrumentation. A marked increase in production has been experienced in the last 10 years, as shown by the accompanying chart. This has been accomplished in part because instrumentation has eliminated the blind spots in the furnace practice and has allowed for the proper assessment of scrap on the furnace operation, which value should not be underestimated.

Roof and checker temperatures, furnace pressure and air-fuel ratio are indicated at all times, thus enabling the individual furnace operator to run at the maximum safe operating limits. This factor of uniformity provided an excellent opportunity to assess any benefits in ingot quality and production by satisfactory melt-in carbons. Experience shows that loss in production resulted because of low or high furnace melts. For example, in heats melting low, furnace production fell off 7½ per cent; in those melting high, production was reduced about 9 per cent. Similarly in quality, on those heats melting low the incidence of off-grade was twice that of those having satisfactory carbon melts and over twice the incidence in off-grade with high melts. This breakdown clearly indicates the advantage of having uniformity in melts.

A standardization in furnace operation will allow adjustments to be made in carburizing material to give satisfactory melts. Any marked change from this can then be attributed to scrap, and insistence on greater uniformity of charge to furnace can be demanded.

Instruments employed by the steelmaking department follow:

1. Bath thermocouple for heat temperature prior to tap.
2. Optical pyrometer for pouring temperatures.
3. Magnetic carbon analyser for tapping carbon. This is important in evaluating the rimming action of heats.

Since the reheating furnaces at the Seattle plant have been completely instrumented, practically no instance of burned steel has developed. Also the controlling of the air-fuel ratio (lowered excess air) has improved the surface of the rolled product. This is in spite of increasing copper content in the available raw materials which, if not controlled within maximum limits, may cause increased surface checking due to differential oxidation.

The more exacting requirements of the steel users make it mandatory that a complete record is kept of rolling temperature of our finished product. This is especially true of the chromium, nickle-chromium and nickel-molybdenum steels being produced. Full benefit of the alloys is not developed unless they are rolled as close to the critical range as possible. Not only is a permanent recording made but a dial is visible both to the heater and roller. Rolling temperatures can also be varied to control the tensile properties. This can be helpful in case of the application of somewhat lower carbon steel to structural sections where by rolling at lower finishing temperatures increased tensile properties are produced. In producing steel to grain size, the finishing temperature of the bar is important and cannot be effectively controlled without permanent temperature recording equipment.

Heaters on the reheating furnaces have been able to do a much better job by having temperature measured at the point of discharge, at the junction soaking and heating zone and at the start of the main heating zone. With this type of installation it is possible to progressively follow the rate of ingot heating through the furnace and the proper relationship between the different zones can be maintained.

From a paper presented at the 1952 Pacific Northwest Metals and Minerals conference, AIME, Hotel Davenport, Spokane, May 8-10.

26″ STRUCTURAL MILL

BUILT BY MORGAN Engineering

DESIGNERS • MANUFACTURERS • CONTRACTORS

BLOOMING MILLS • PLATE MILLS • STRUCTURAL MILLS

ELECTRIC TRAVELING CRANES • CHARGING MACHINES

INGOT STRIPPING MACHINES • SOAKING PIT CRANES

ELECTRIC WELDED FABRICATION • LADLE CRANES

STEAM HAMMERS • STEAM HYDRAULIC FORGING PRESSES

SPECIAL MACHINERY FOR STEEL MILLS

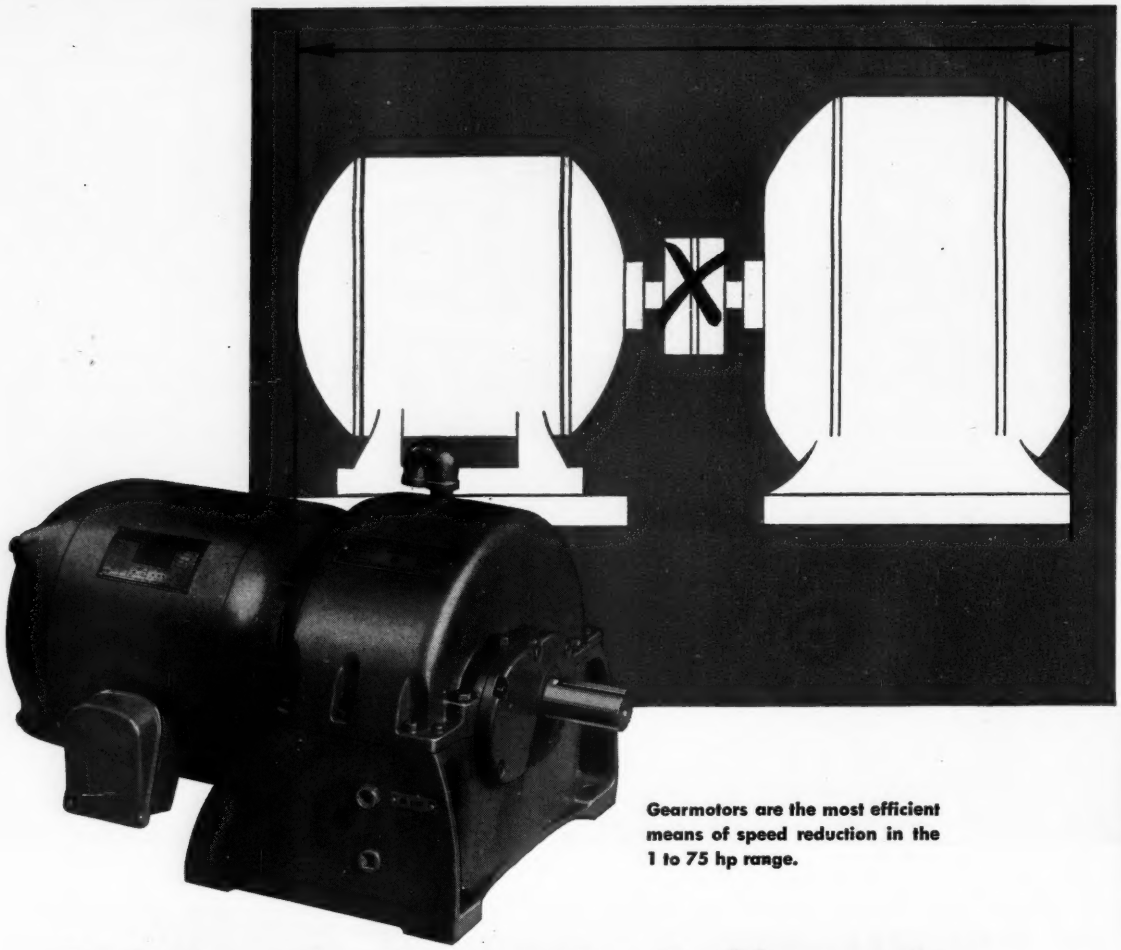
THE MORGAN ENGINEERING CO.

ALLIANCE, OHIO PITTSBURGH—1420 OLIVER BUILDING

Illustrated is a 26″ Three-High Structural Mill, consisting of one 26″ Three-High Pinion Stand connected to two Three-High Roll Stands and one Two-High Pinion Stand connected to one Two-High Finishing Stand.

For serving this mill, there was furnished four Traveling and Tilting Tables and four Traveling Trailing Tables.

Your inquiries for mill equipment will be appreciated.



Gearmotors are the most efficient means of speed reduction in the 1 to 75 hp range.

Small size and unit construction simplify mounting of Life-Line GEARMOTORS

Gearmotors provide the ultimate in compactness. Life-Line Gearmotors give you this compactness, plus many exclusive features not available in any other make. When mounting space is at a premium—Life-Line Gearmotors simplify the problem.

They are self-contained . . . can be installed quickly and conveniently. There's no handling, mounting and aligning of a separate motor, coupling and subbase or bedplate.

Life-Line Gearmotors also offer you these advantages: fewer moving parts, require less maintenance—are easier to inspect and service—are designed, built and serviced by ONE manufacturer.

Use the most efficient means of speed reduction. Use Life-Line Gearmotors. Call your Westinghouse representative for the facts, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-07310

YOU CAN BE SURE...IF IT'S Westinghouse

Life-Line GEARMOTORS

Boron Steels Studied

Minerals and Metals Advisory Board shifts emphasis to specific properties and applications

BORON lean-alloy steels have progressed beyond the experimental stage and now should be subjected to a thoroughgoing research and development program to promote their use on a sound basis.

That is the gist of a report to the Defense Department's Research and Development Board by its Minerals and Metals Advisory Board. The latter operates as a unit of the contracting organization, the National Academy of Sciences. Chairman of the Minerals and Metals Advisory Board is Dr. Francis C. Frary. Vice chairmen are Dr. Zay Jeffries and Dr. R. F. Mehl.

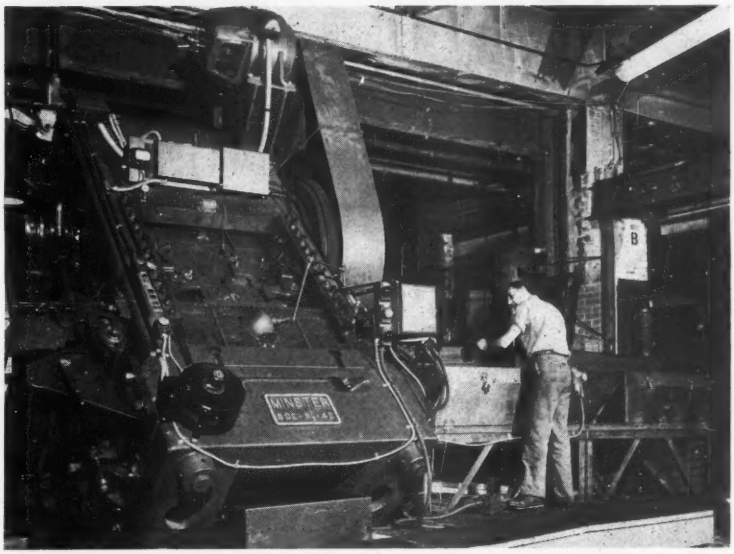
As a matter of expediency, largely, the report says, research over the last 10 years has aimed mainly at determining the mechanical properties of boron steels for specific applications, and their behavior in fabricating and heat treating process incidental to those applications. Now it is desirable to shift the emphasis to research and development projects dealing with specific properties and applications of the boron steels. Some of this work is already under contract and the board recommends that it be expanded. Altogether, 29 different projects are recommended.

Hardenability Research — Under this head the board calls for these investigations: Effect of boron on case hardenability in comparison with core hardenability of carburized steels; effect of nitrogen from nitrides of carburizing compounds on case hardenability of boron steels; effect of boron on pearlitic hardenability and bainitic hardenability; effect of boron as the cross sectional size of the piece increases, in order to evaluate loss of toughness in partially hardened and annealed structures, and loss of hardenability resulting from long-time or high-temperature soaking required when treating or fabricating large sections; interrelation between boron effectiveness and steelmaking practices to evaluate the effect of the different deoxidizing elements, and practices which will insure maximum increase of hardenability; relation between austenitizing temperatures and subsequent response to hardening; factors which control the shape of hardenability curves of boron steels; practices which will reduce the width of the hardenability band of boron steels.

Under the head stress distribution in quenched and tempered steels, the board calls for these investigations, to apply to all engineering steels, both with and without boron: Development of an accurate and less complex method for determining the stress patterns in quenched case-carburized gears; investigate the effect of change of shape of hardenability curve on stress patterns; investigate the influence of lowered tempering temperature on residual stress patterns; determine the quench-cracking susceptibility of boron steels compared to nonboron steels with comparable carbon content and hardenability.

Properties of Boron Steels. The board calls for not only investigations on properties of boron steels, but for companion data on the same steels without boron, and on higher alloy nonboron steels with equivalent hardenability. Investigations on impact strength or notch sensitivity should be conducted over the range of testing temperature necessary to develop completely ductile and completely brittle failures.

Projects recommended for investigations: Welding characteristics of boron steels and mechanical properties in the weld and heat-affected zones; susceptibility of boron steels to embrittlement when tempered at high temperatures; effect of titanium content in boron steels on the susceptibility to embrittlement when tempered at high temperatures; fatigue properties of boron steels as related to initiation of crack, to crack propagation, and fracture; relation between fatigue properties and notch sensitivity; mechanical properties between the limits of 700 and 1100° F for boron steels applicable to aircraft, power and petroleum end use; effectiveness of boron in replacing other alloying elements in homogeneous armour plate, face-hardened armor plate, bullet cores,



Firm Follows its Own Prescription

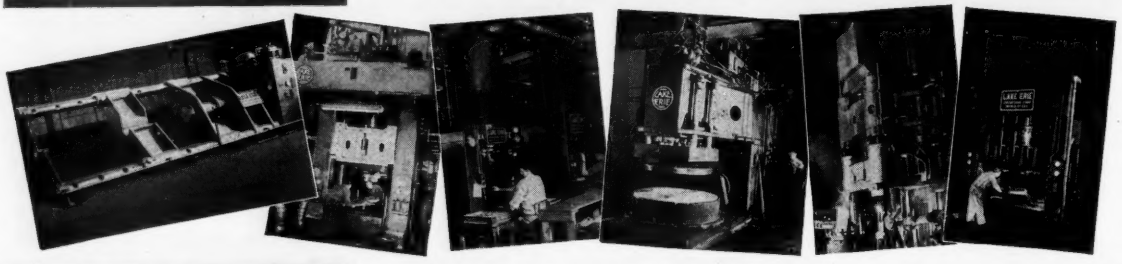
Effective production equipment control is gained by Reliance Electric & Engineering Co., Cleveland, by applying its own packaged-type drive system to its plant tools. Here, the firm uses a 15-hp *VS* electric adjustable speed drive on a Minster inclinable punch press in producing rotor and stator laminations at the Ashtabula, O., plant. Speeds range from 30 to 120 strokes per minute

We do it for OTHERS

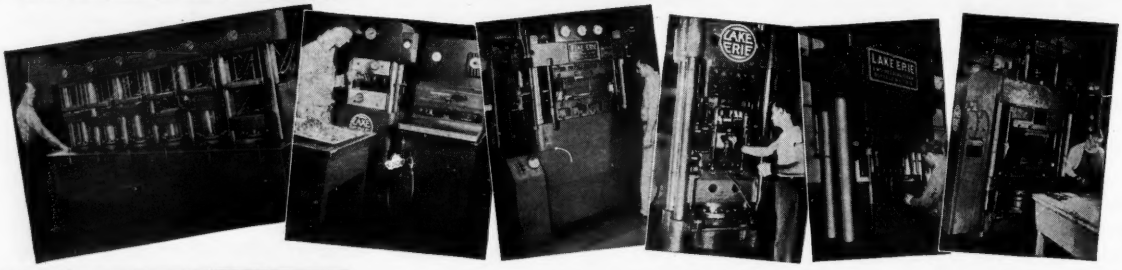
We have developed more than 3,500 *different designs* of hydraulic presses of *all types* to cut costs, simplify manufacture, improve quality and increase production for others.

FORMING • EMBOSSING • COINING

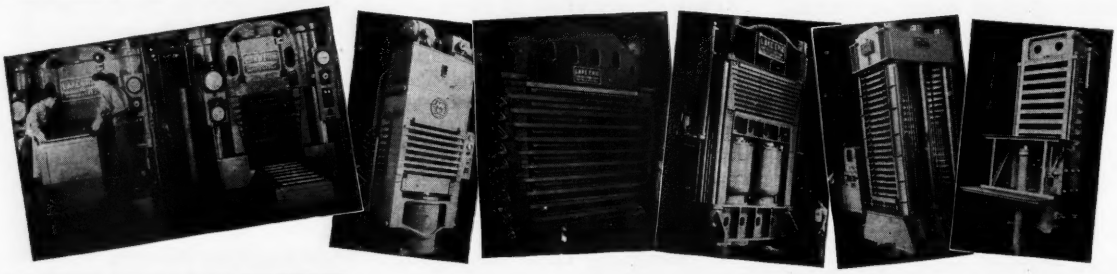
METAL WORKING — DRAWING • BENDING • FORCING



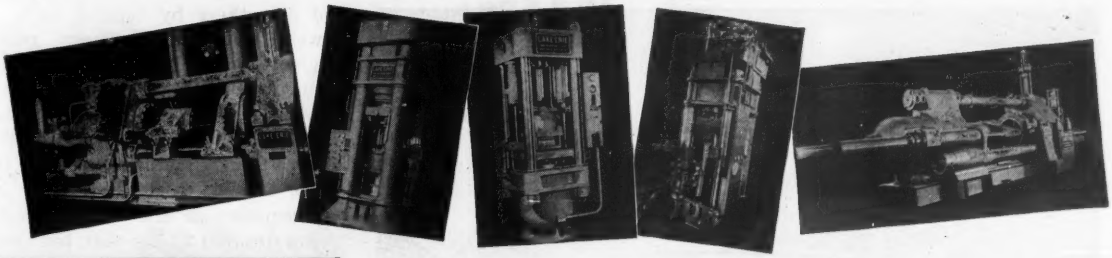
METAL WORKING — FORGING • HOBBING • FLANGING



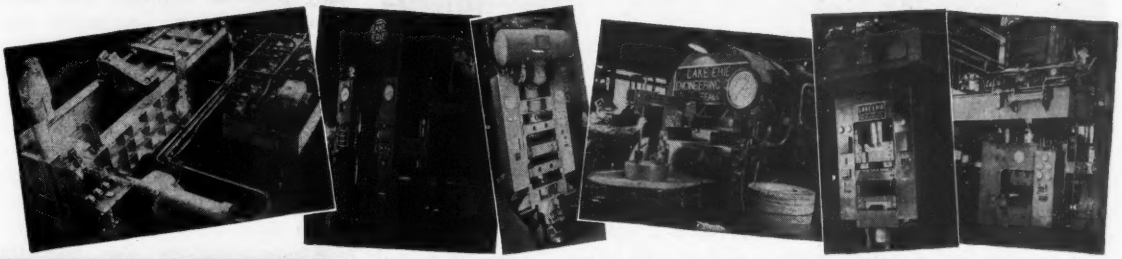
PLASTIC MOLDING — COMPRESSION • TRANSFER • LABORATORY



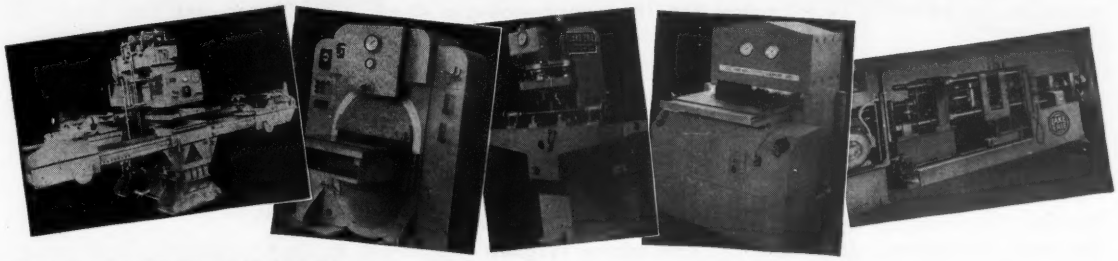
WOOD & PLASTIC PANELS — HARDBOARD • WALLBOARD • PLYWOOD • LAMINATES



EXTRUSION PRESSES LEAD • CARBON • NON-FERROUS METAL



BRIQUETTING & BALING METAL POWDER • CARBON • REFRACTORY • GRINDING WHEEL • SCRAP



MISCELLANEOUS STRAIGHTENING • DIE CASTING • BELT • STEREOTYPE MOLDING

We can do it for YOU!

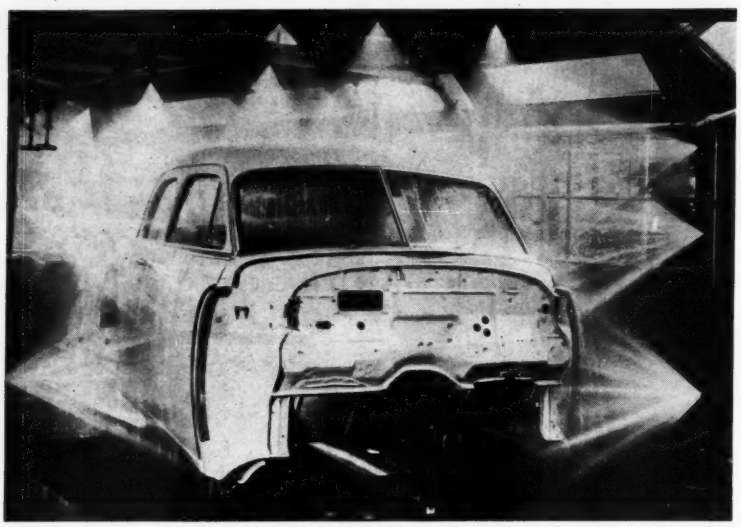
With the broadest line of equipment in the entire industry, we can supply hydraulic presses for every application that are *guaranteed to lower your costs* and improve your production. A recommendation will cost you nothing. Write or phone us.

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.

LAKE ERIE ®

LAKE ERIE ENGINEERING CORP.
MANUFACTURERS OF
HYDRAULIC PRESSES AND SPECIAL MACHINERY
General Offices and Plant:
882 **Woodward Avenue** **Buffalo 17, New York**
DISTRICT OFFICES IN NEW YORK, CHICAGO and DETROIT
Representatives in Other Principal Cities in the United States and Foreign Countries
Manufactured in Canada by: Canada Iron Foundries Limited

Leading manufacturer of hydraulic presses — all sizes and types Metal Working . . . Plastic Molding . . . Forging . . . Metal Extrusion . . . Processing . . . Rubber Vulcanizing . . . Stereotype Molding Plywood . . . Wallboard . . . Briquetting . . Baling . . . Special Purpose.



High Pressure Test for Moisture Seal

High pressure jets of water provide a realistic and effective means of testing modern methods of sealing automobile bodies against moisture, dust and drafts. Tests are run in a 100-foot water tunnel at DeSoto's Detroit body plant. In 4 minutes, the car body is hit by 550 gallons from 78 nozzles operating at 40 psi

nitralloy and low-alloy, high-strength steels; mechanical properties of boron steels which have been hardened to more than 50 per cent martensite.

Fundamental Research.—Under the head "fundamental research," the board recommends investigations to: Determine the effect of boron on the rate of nucleation of pearlite, and bainite; identify the compound (or complex) at the grain boundaries of boron steel; determine the iron-carbon-nitrogen system and the effect of nitrogen on retarding transformation; determine the rate of diffusion of boron in steels; determine the solubility and nature of the solid solution of boron in gamma and alpha iron.

The board also recommends research projects to seek other elements which may increase hardenability as effectively as boron; to determine the effect of phosphorus on the mechanical properties of steels and the extent to which it can be used to replace more critical alloying elements; to determine the effect of silicon on the mechanical properties of steels and the extent to which it can be used to replace more critical alloying elements; to determine chemical or metallographic methods for determining the amount of effective boron present in steels.

Mishaps Down, Severity Up

Safety Council reports communications still the safest and coal mining toughest

WORKERS employed by member companies of the National Safety Council had fewer accidents in 1951. But the mishaps they did have were more serious.

Industrial injury rates for last year, released by the council in advance of the 1952 edition of its annual statistical yearbook, "Accident Facts," show a modest reduction in frequency. However, they indicate an equal increase in severity of 1951 accidents as compared with 1950.

Twenty-seven of the 40 basic industry classifications reduced their frequency rates, and 20 reduced severity rates.

Down 3 per cent—Accident frequency rate for employees in all industries submitting company reports to the Council, based on the number of disabling injuries per 1 million manhours, was 9.06 in 1951. This is a reduction of 3 per cent from 1950.

Communications industry again led all others by turning in the lowest employee frequency rate. Its rate was 1.79—a 13 per cent reduction. Electrical equipment ranked second with 4.04, followed by the cement industry with 4.22. Aircraft manufacturing, second in 1950, dropped to eighth.

Frequency of coal mining accidents dropped 22 per cent, but that industry remained in the next to last position with a 34.12 rate. The clay products industry was third from the bottom, just below marine transportation.

Severity Up—Accident severity rate for all industries reporting to the council, based on the number of days lost per 1000 man-hours, was 0.97 last year. This figure represents an increase of 3 per cent from 1950.

Communications also had the lowest severity rate, leading all other industries with a rate of 0.09—a 25 per cent drop from 1950. The service industry slipped to fourth place in 1951 from second in 1950 with a 42 per cent increase.

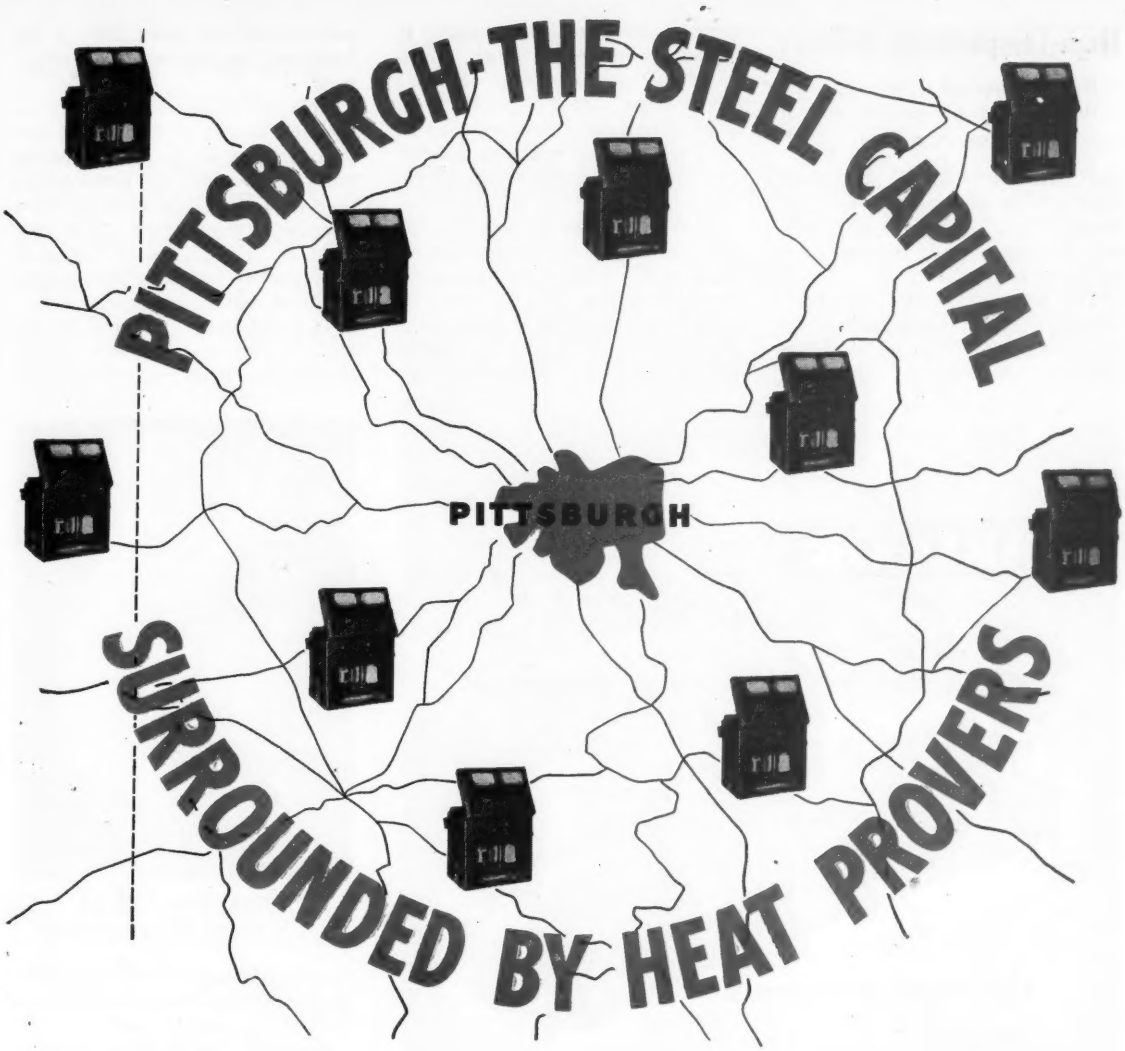
In terms of severity, coal mining once more stayed at the bottom of the list. It had the highest accident severity rate of 6.77—a 14 per cent decrease.

Visual Aid to Mechanization

Visual program aimed at raising productivity through a modern step-by-step approach to industrial mechanization problems is announced by General Electric Co. Project is an attempt to present a concise, workable consolidation of production technique principles.

Program consists of three basic parts: Manual, survey form and check list, and sound-color motion picture. Film is titled "Motors in Industry." It shows progressive mechanization through four stages, from hand operation to simple machine, improved machine, automatic control, continuous process.

Manual defines p r o g r e s s i v e mechanization, explaining effect on productivity, product quality and costs and shows how it can be developed in several industrial situations. Survey form and check list is a single sheet extracted from the manual to act as a guide for following recommended processes and obtaining machines.



When your eye is on Pittsburgh—and three dozen towns in its orbit—you're spotting scores of furnace operations regularly checked by Cities Service Heat Provers. Here, where they know all kinds of furnace instruments, and where high efficiency is most urgent today, the application of Heat Provers by Cities Service is increasingly valued.

It takes the Heat Prover to read simultaneously for oxygen and combustibles, measured direct by actual gas analysis. And the Heat Prover's continuous rapid sampling reveals effects of furnace adjustments at once. The Heat Prover frees you of maintenance too, because it's *not an instrument you buy, but a Service we supply*. Learn how it can raise productivity for you . . . in iron, steel, ceramics, glass, cement or any other furnace operation. Write CITIES SERVICE OIL COMPANY, Dept. F24X, Sixty Wall Tower, New York City 5.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

High-Temperature X-Rays

Hot radiography process cuts the cooling off period out of welding inspection time

HOT RADIOGRAPHY technique that works successfully at high temperatures by-passes time-consuming steps usually necessary for effective inspection.

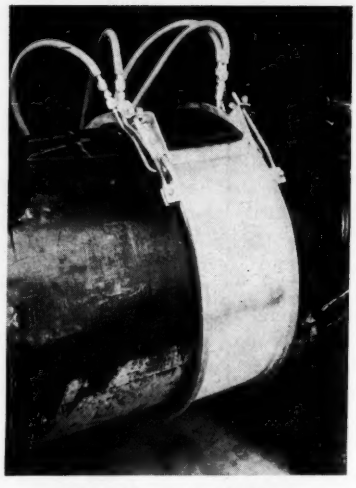
This technique, called the McElroy-McNutt process, permits x-ray photographs of large pipes, valves and similar units to be taken at temperatures as high as 1200° F.

Sam Tour & Co. Inc., holder of exclusive licensing rights on the process, report it has been applied successfully to inspection of partly completed welds on hot sections to check possible welding defects.

Cooling off Period — Inspection by radiography involves taking a picture of a material by placing a sensitized film on one side, a source of gamma or x-rays on the other. Operating under the ordinary technique, a pipe must be cooled down to about 100° F before the film can be placed on the weld.

An even longer delay before inspection occurs in work with certain types of alloys where cooling must be preceded by post-heating the weld to relieve internal stresses. Because of the lengthy period that must be allowed for cooling, general practice has been to complete the weld before inspection.

To avoid the delay, the McElroy-McNutt process employs a special film holder, with cooling fluid circulating through hollow chambers. Design protects film emulsion from heat of the welded section.



SPECIAL FILM HOLDER
. . . a bypass for radiographers

Practical Interruption—Radiography that can be accomplished on a hot pipe makes it practical to interrupt the welding operation to inspect the root where most flaws occur. Application of this technique means saving many hours of heating and controlled cooling required formerly before inspection. Secondary time saving results as a natural consequence, because it is necessary to chip away only a partly-completed defective weld instead of cutting back a finished job.

For example, Tour & Co. cite work at an eastern power plant where welding on comparable sections of pipe was reduced from nine to less than three days after application of the hot process. The firm says its technique also can be used for radiography of other hot metallic forms.

ARDCOR Engineered
MEANS BETTER COLD-ROLL FORMING
ROLL FORMING MACHINES
PUNCH TYPE CUT-OFFS
LOCK SEAM TUBE MILLS
ARDCORLOY TUBING ROLLS AND FORMING ROLLS
To Your Specifications or Ardcor Design
— for all makes of machines
American ROLLER DIE CORPORATION
20700 St. Clair Avenue · Cleveland 17, Ohio

CALENDAR
OF MEETINGS

June 29-July 2, National Industrial Advertisers Association: Annual meeting, Palmer House, Chicago. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 29-July 2, Caster & Floor Truck Manufacturers Association: Joint material handling, industrial meeting, Grand Hotel, Mackinac Island, Mich. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 30-July 2, Materials Handling Institute: Annual meeting, Grand Hotel, Mackinac Island, Mich. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

July 18-19, Truck-Trailer Manufacturers Association: Annual summer meeting, Edgewater Beach Hotel, Chicago. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Huise.

July 25, Malleable Founders Society: Western sectional meeting, Hotel Drake, Chicago. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

August 11-13, Society of Automotive Engineers: National West Coast meeting, Fairmont Hotel, San Francisco. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

August 19-22, American Institute of Electrical Engineers: Pacific general meeting, Phoenix, Ariz. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

Accessories Ease Recorder Use

Continuous drive film holder for use with its portable PM-18 oscillograph is reported by General Electric Co.'s Meter & Instrument Department. The holder is made for applications that require a longer record than can be obtained from either the film pack or polaroid Land film holder.

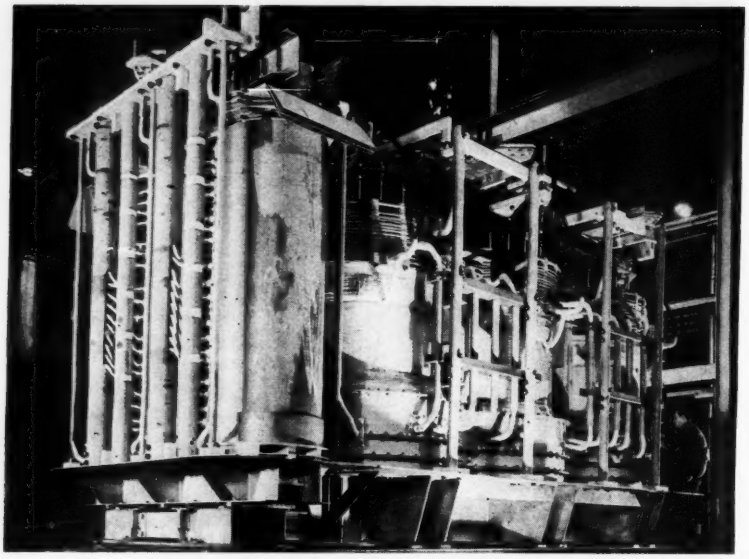
Another accessory developed by the company for its oscillograph unit is a viewing attachment to permit users to observe the wave form before taking a record. Available also is a galvanometer with sensitivity of 1.67 millimeters per microampere at 1 meter. A sweep mirror provides adjustable time sweep of 0.1 to 0.5 second in addition to the original nonadjustable 1/60-second sweep.

Stainless Cutting Charted

Twelve operations in cutting and forming stainless steels are illustrated in a wall chart published by Armco Steel Corp., Middletown, O. Chart covers such practices as care in handling, proper protection, shearing, snipping, hand-sawing, forming in brake and roll forming. The two-color reference is available to sheet metal departments from Armco's stainless sheet distributors.

●You can find the answer to your special fastener problems in a Circle Ⓑ bolt designed and made for your job. We'd like to show you how these special fasteners can add strength to your products while simplifying design and production problems. Follow the lead of well known producers who agree that "the best start to end fastener problems is to call in Buffalo Bolt."

● The NO. 51 Catalog is the simplest, most concise and complete catalog to specify and order fasteners. Let us send it to you.



AEC GETS MORE POWER AT PADUCAH

. . . new autotransformer provides regulated output of 156,000 kv

Autotransformer Boosts AEC's Power

Three-phase unit will be used at the Paducah, Ky., works to tie together 230-kv and 138-kv systems. GE says it is the largest in capacity and size ever built

THREE-PHASE autotransformer, combining a reported record high voltage and kilovolt-ampere rating, soon will help supply power for Atomic Energy Commission's project near Paducah, Ky. Equipment is being completed at Pittsfield, Mass., by General Electric Co.'s Power Transformer Department.

Effect of the three-phase, 60-cycle unit will be a step-up from 138 kv to 230 kv. It will provide regulated output of 156,000 kva, varying over a range 10 per cent below and 10 per cent above the 138,000 grounded Y connection.

Problem for Movers—Company says its transformer is the largest in capacity and size ever built. Dimensions reported show the unit is 361 inches long, 211 inches wide and 271 inches high—including the high voltage bushings. GE will ship the transformer upright in its own one-piece tank. Special drop-frame railroad car will be needed to do the transporting job.

Transformer was made for Illinois Power Co., Decatur, Ill. The power company is a member of the midwestern power pool called Electric Energy Inc., comprising utilities co-operating to supply power for the Paducah project.

Construction Trend — Following a trend that began more than a year ago, the unit's load-ratio-control reactors are located in a transition compartment between the main tank and the load-ratio-control compartment. GE engineers point out that this construction saves both weight and space.

Main and series transformers are cooled by forced oil circulation through ducts in the cores and windings. Oil-to-air heat exchangers located on the outside of the tank remove heat from the oil.

Electric Design Work Revised

Revised edition of "Design Manual on Aircraft Electrical Installations" is published by Aircraft Industries Association of America Inc., Washington. Revision was completed by the association's committee on electrical installations.

Edition contains supplementary information gained by design know-how of industrial engineers. Contributions were also received from the Air Force, Navy and Civil Aeronautics Administration.

Topics covered in the manual's 16 chapters include circuit protection; circuits for essential equipment; cable selection and routing; electrical equipment selection and installation; maintenance, operation and inspection; and electrical system tests. Chapter on equipment selection and installation makes available a detailed check list to help evaluate equipment for ground and flight requirements.

New Guide to Refractories

Refractories Institute reports it is beginning work on a revised product directory of U. S. refractory manufacturers. The 1952 edition will supersede the volume published in 1942. It will include for the first time a section on optional product classification by American Society for Testing Materials or by the manufacturer's own designation of his product's quality.

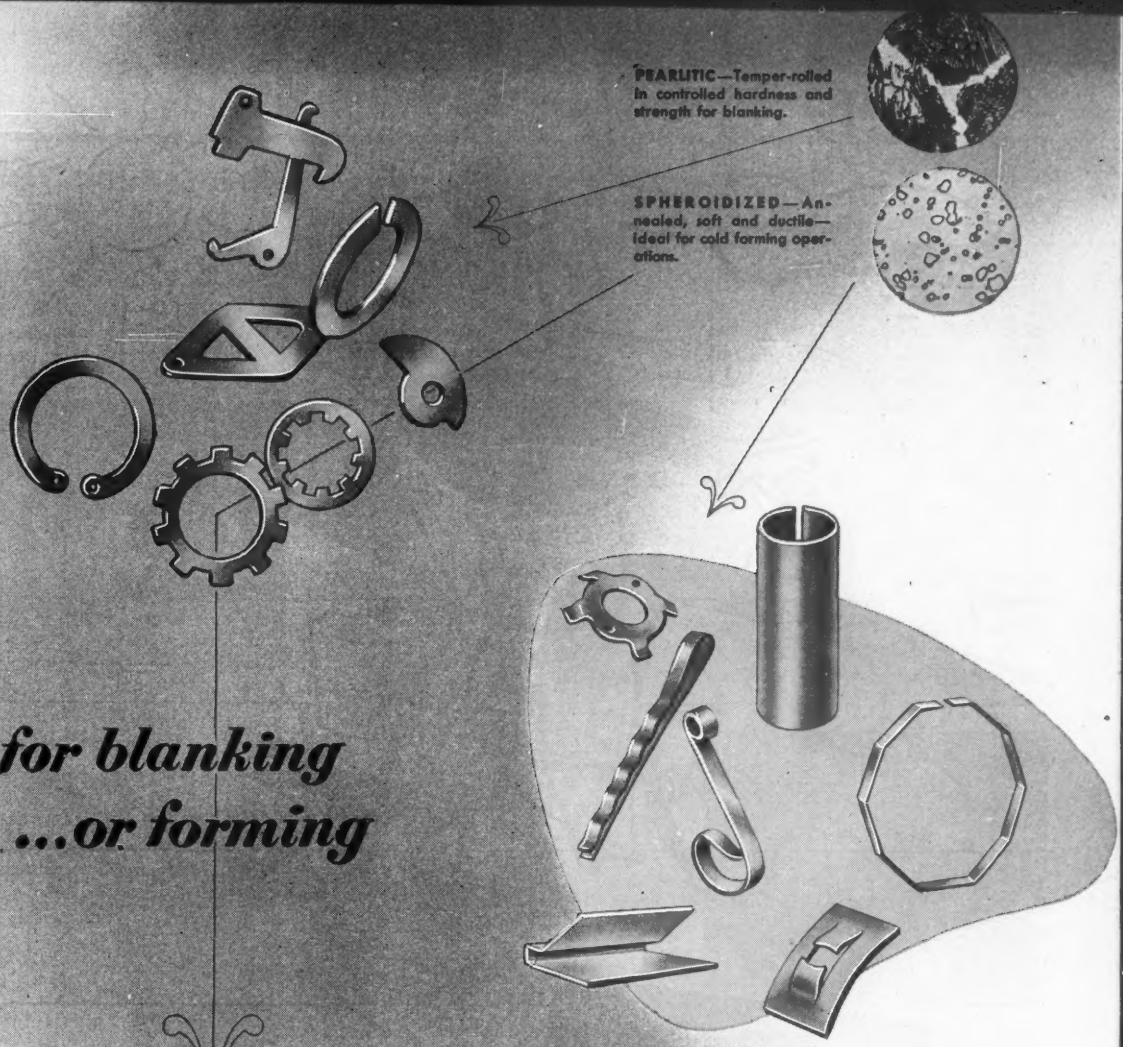
Directory will also make available names and plant locations of all refractory manufacturers, office addresses, product brand names and divisions of the industry.

Pre-Bonds Brake Linings

Brake relining method that calls for bonding brake lining to a metal backing plate at the factory should make installation possible with ordinary hand tools. Manufacturer, Lock-On Brake Lining Corp., Los Angeles, reports linings can be installed to brake shoes that originally were bonded or riveted. The firm makes 13 sizes which it says fit 97 per cent of all American-made automobiles and light trucks.

Quick Check for Spray Painters

Complete guide to spray painting is published by DeVilbiss Co., Toledo, O. Company summarizes short cuts and data covering equipment and procedures, including job setups in metal finishing work. Guide covers various finishing materials used in spray painting procedures. Trouble shooting chart should enable operators to check equipment and application techniques.


PEARLITIC—Temper-rolled in controlled hardness and strength for blanking.
SPHEROIDIZED—Annealed, soft and ductile—ideal for cold forming operations.
for blanking
...or forming

it's easier when you use WEIRTON HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

Either for blanking or for forming, there is a Weirton cold-rolled spring steel having special qualities and properties that make the operation easier to perform and make the manufactured product better. You will always get consistent results, too—because Weirton's close control over every step of manufacture assures constant uniformity.

You can count on Weirton High-Carbon Strip cold-rolled spring steel . . . for accurate response to heat treatment —uniformity of gauge and width—uniform chemical and physical properties—exact constancy of grain structure —controlled decarburization limits.

Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Iron and Steel
need protection too!

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania
The World's Largest Job Galvanizing Plant
A. J. DIEBOLD, President

In the heart of the STEEL INDUSTRY

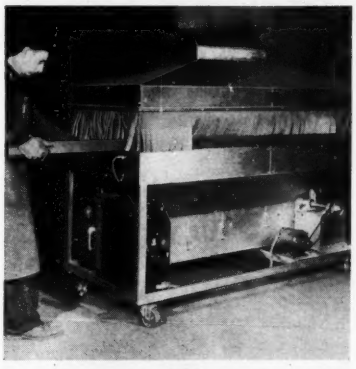
galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment

Aluminum Bar Heating Furnace

USE REPLY CARD—CIRCLE No. 1

Special aluminum bars can be heated to about 300° F before forming in a furnace made by Pereny Equipment Co., Columbus, O. Oven size is 3 feet wide, 6 feet long, 8 inches high, equipped



. . . heats bars to 300° F before forming

with a blower to produce proper recirculation of the heated air. Asbestos strip curtain provides a semiclosed opening for feeding and discharging the bars. Unit is mounted on rollers so it can be moved to the location of forming operations.

Controls include temperature indicator and controller, instrument transformer, magnetic contactor, switch box and motor starter. Power requirements are 36-kw, 440-v, 3-phase. Fin-type strip heaters comprise the heater elements.

Fan Cuts Fumes and Vapors

USE REPLY CARD—CIRCLE No. 2

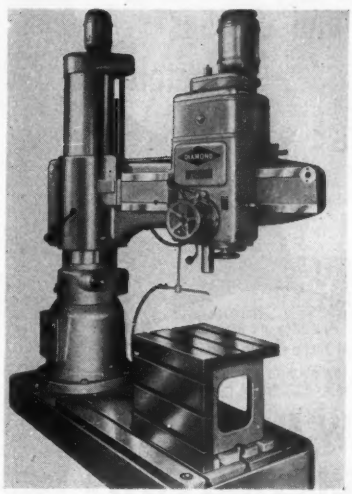
General purpose fan made for applications where it is necessary to have the motor outside the air stream is available from Standard Electric Mfg. Co. Inc., West Berlin, N. J. Developed for exhausting hazardous fumes, dirt, heat or other obnoxious elements, the unit has explosion-proof, enclosed or open-type motors available as required.

Features include sealed SKF bearings in readily replaceable flange construction. Double angle motor support minimizes vibration. Adjustable motor base provides for belt takeup. Heavy cast aluminum fan blades are made in a size range of 18 to 42 inches. Motor sizes ¼ to 7½-hp are available as required. Capacities reach 30,500-cfm free delivery.

Radial Drilling Machine

USE REPLY CARD—CIRCLE No. 3

Heavy duty radial drilling machine with sizes 3 through 8 feet is introduced by Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif. Drill arm is designed to move on the sleeve on three guiding surfaces. Length



. . . arm moves on three guiding surfaces

of the bearing helps assure absence of tilt and distortion in the horizontal as well as the vertical plane. Column and sleeve are built with dimensions sufficient to withstand stresses even in the most unfavorable position.

Saddle moves on the arm. When unclamped, it can be moved by hand on rollers on a strip of hardened spring steel. Disk clutch, in the top part of the saddle, permits smooth starting of the drilling spindle. This latter factor indicates an advantage when tapping.

REPLY CARDS

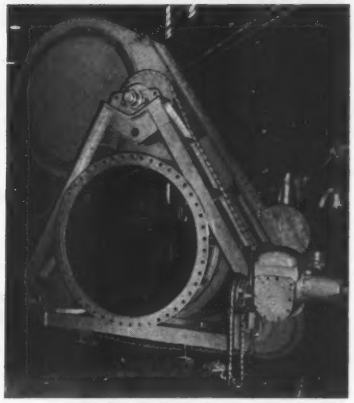
on page 113 will bring you more information on any new products and equipment in this section.

Goggle-Type Plate Valve

USE REPLY CARD—CIRCLE No. 4

Electrical operation with pushbutton control is a feature added to the goggle-type plate valves for large diameter blast furnace and coke oven gas mains by Salem-Brosius Inc., Pittsburgh 15, Pa. Two heavy-duty electrical units control and operate plate swing in the valve, and opening and closing of the valve proper.

Application is made to insure easier operation, better closing and more positive positioning of the valve in all sizes from 36 to 108 inches diameter. Electrical unit operates on 220-330 or 440-550-v



. . . incorporates pushbutton control

plant power. Its speed reduction is 170:1. It has a built-in hammer blow arrangement for loosening parts set by scale or rust.

Drive Mounting Interchangeable

USE REPLY CARD—CIRCLE No. 5

Variable speed drive with mounting dimensions interchangeable with standard NEMA motors is announced by Sterling Electric Motors Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif. Variable speed transmission has positively adjusted pulleys. Induction motor is built in a single, compact unit.

Design should save cost of building special bases where interchangeability between variable

LOW COST
IRIDITE®
FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide corrosion resistance
paint base
choice of appearance

And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.

LOW MATERIAL AND SHIPPING COSTS

combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

speed drives and standard motors is necessary. Drive is available in single phase from 1 to 3-hp, in polyphase from 1 to 15-hp, with 2:1, 3:1 or 4:1 speed variations.

Precision Drilling Machine

USE REPLY CARD—CIRCLE No. 6

Infinitely variable speeds from 150 to 4000-rpm can be attained on a precision drilling machine made by Electro-Mechano Co., 178 E. Erie St., Milwaukee, Wis. Machine also features built-in back gears and standard ½-hp motor for single or three-phase operation.

. . . instant selection from 150 to 4000-rpm

Compact design encloses speed control and motor. Speed control dial located at the front of the machine gives approximate speeds for different metals and drill sizes.

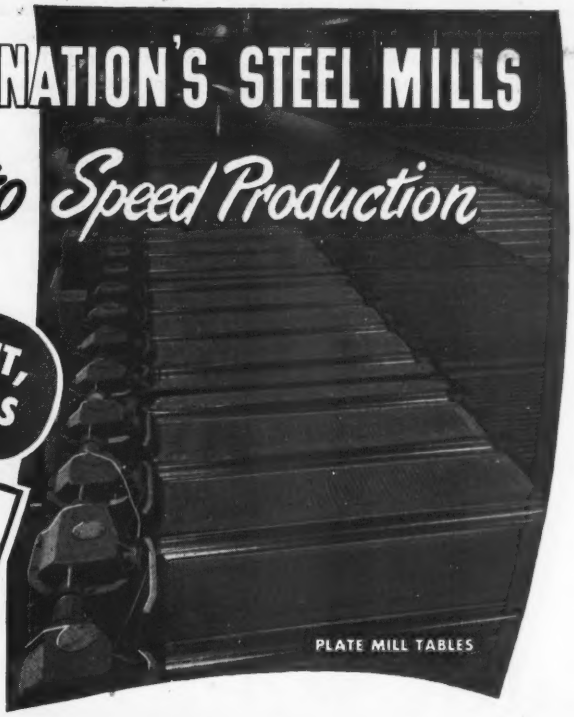
Electronic Surface Comparator

USE REPLY CARD—CIRCLE No. 7

Surface roughness can be determined at point of production with a portable electronic surface comparator offered by Kota-Meters Inc., 2311 Burbank St., Dallas 19, Tex. Instrument, model 100, has a 1 to 100 microinches roughness range. It evaluates surface finish quality and indicates index on a meter with needle at an arrested or frozen position. It operates without need for visual or mental averaging.

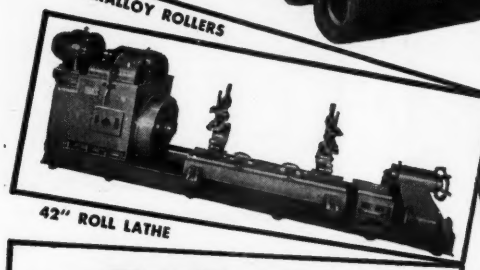
Comparator is applicable for any finished surface, flat or curved.

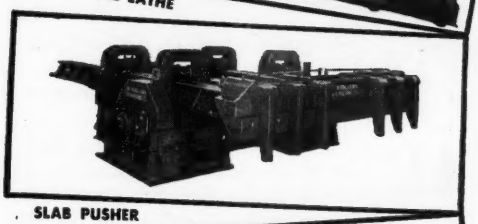
F&Ym EQUIPS THE NATION'S STEEL MILLS to Speed Production

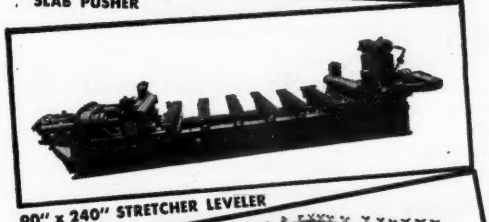


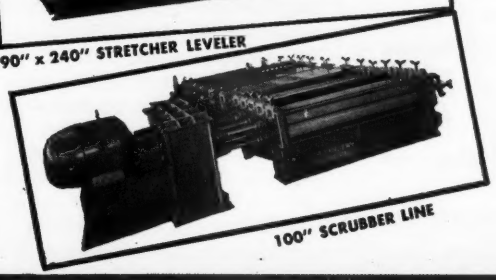
MACHINES, EQUIPMENT, ROLLS AND CASTINGS

PARALLOY ROLLERS


42" ROLL LATHE


SLAB PUSHER


90" x 240" STRETCHER LEVELER


100" SCRUBBER LINE

Check this List for the Products You Need

- PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

Instrument's probe is hand-held. Shape and design permit universal application to radial, longitudinal, internal or external surface shapes.

Divider Speeds Gear Change

USE REPLY CARD—CIRCLE No. 8

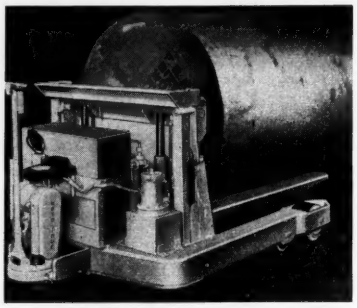
Stock divider announced by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich., permits a machine operator to clamp each gear on its arbor while its predecessor is being ground. This means the only grinder down time is that required to unload the finished gear and immediately load the next. Divider consists of a movable head and tailstocks, and a checking head adjustable to work gear diameter. The latter has a removable nosepiece and a spring-loaded spindle that actuates a dial indicator for reading gear eccentricity.

Arbor carrying the work gear is set between the stock divider centers and arbor driving dog in contact with the adjustable locating button. Work gear rotating on its arbor is then checked for eccentricity at several points around its circumference. High point is found and positioned in relation to the driving dog. Gear is locked on the arbor with nosepiece still in mesh.

Battery-Powered Lift Truck

USE REPLY CARD—CIRCLE No. 9

Moto-Truc Co., 1959 E. 59th St., Cleveland 3, O., introduces an 8000-pound capacity lift truck. Truck is powered by an 18-v battery power unit and has a maximum 14-inch hydraulic lift. Load



. . . 8000-pound model has 14-inch lift

length is 8 feet. Dual 10 and 7-inch load wheels are employed to prevent front wheels from wedging in floor slats.

Travel speed is 2½-mph loaded, 3 mph unloaded. Dead man controls are standard; automotive-type brake is applied to the drive wheel.

Gravity Conveyor Capacity Up

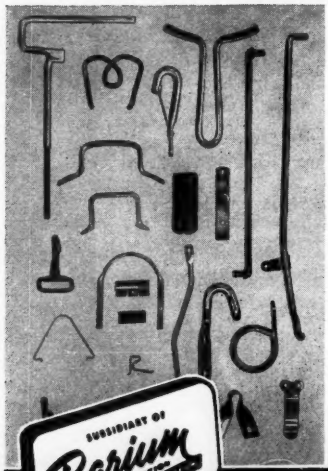
USE REPLY CARD—CIRCLE No. 10

Increased load capacity in its Rapid-Wheel gravity conveyor is announced by Rapids-Standard Co. Inc. Grand Rapids, Mich. To gain extra strength and rigidity, conveyor's 3½-inch deep channel frames are made of 12-gage steel. Each wheel lane is reinforced with a steel center band that supports the axles at point of greatest strain. These construction features permit distributed loads up to 2000 pounds to be handled on a 5-foot section.

Conveyor is made in 5 and 10-foot sections, 12 and 18-inch widths and is available in 45 and 90-degree curves. Either tubular or channel-type guard rails can be

Stumped By an Unusual Wire Form or Assembly Problem?

BRING IT to CUYAHOGA!



DESIGNING AND ENGINEERING the unusual is an everyday occurrence with Cuyahoga's engineers and wire part craftsmen. They know the possibilities and limitations of wire forming machinery . . . they also know their metallurgy, heat treating and chemistry.

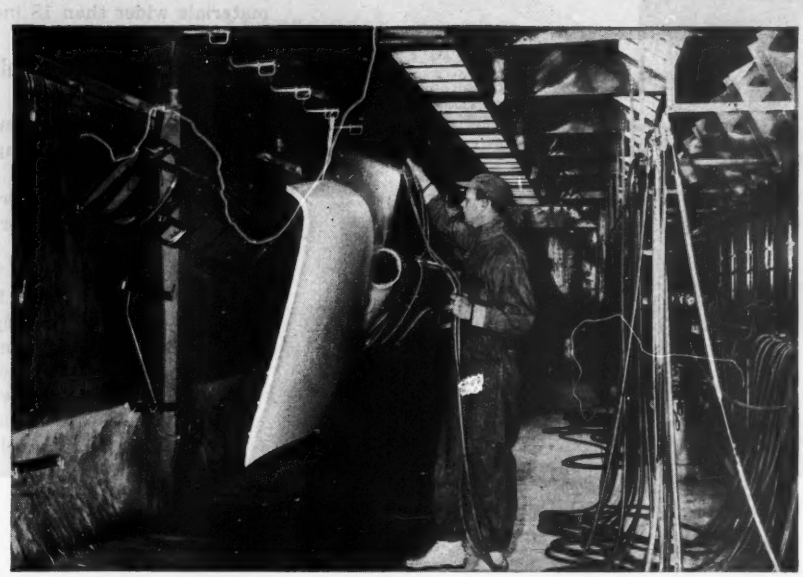
Every type or any style of wire forming is available at Cuyahoga . . . welded, swaged, threaded and flattened ends . . . whether plated, painted, galvanized or tinned . . . if it can be made from round or flat wire, Cuyahoga can make it.

Contact your Cuyahoga representative or write direct.

SUBSIDIARY OF Barium STEEL CORPORATION

The CUYAHOGA SPRING Co.

10200 BEREA ROAD • CLEVELAND 2, OHIO



A NEW FACE *for a* NEW JOB!

Did you ever hear of a spray painting booth where the men could work without wearing masks? And if YOU are directly responsible for the efficiency, safety and production of such a booth, did you ever think of the improvement that could be effected in general conditions if the men could work unhampered? Well, the illustration above shows spray painters at work in a PETERS-DALTON CONVEYORIZED booth in a leading West Coast auto plant. THEY ARE WORKING WITHOUT MASKS! The higher suction and greater washing action of PETERS-DALTON HYDRO-WHIRL SYSTEMS guarantee maximum efficiency with maximum safety. If any of your manufacturing problems concern PAINT SPRAY BOOTHS, METAL WASHING EQUIPMENT, DRYING and BAKING OVENS, DUST COLLECTING SYSTEMS, it will pay you to investigate PETERS-DALTON. We believe in safety, production and "good housekeeping"—and incorporate these three important qualities into our equipment.

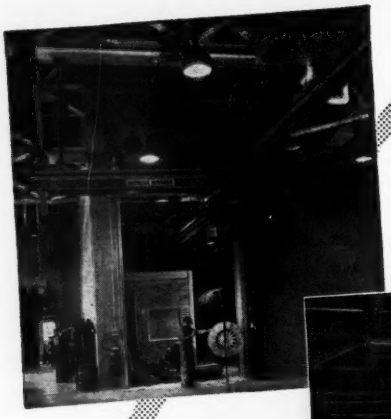
For Paint Spray Booths • Metal Washing Equipment • Drying and Baking Ovens • Dust Collecting Systems. Inquire Today.

HYDRO-WHIRL

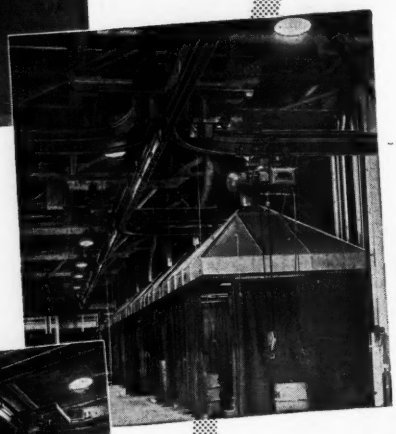
For Finer Finishing Equipment—In Any Industry—It's

PETERS-DALTON Inc.

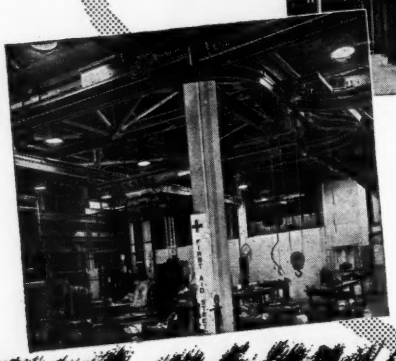
17934 RYAN ROAD • DETROIT 12, MICHIGAN



Railmaster 3-ton crane serves the paint shop area and interlocks via track curve with crane serving the sand blast room. Interlocking track is equipped with opener to allow fire door closure.



Track and switches with spur tracks over welding booths for easy spotting of heavy loads in booths.



Compact track and crane system over the electrical shop area. Note hand chain drop section on extreme left, which lowers a hoist carrier for service or repair.

MONORAIL REDUCES
Maintenance Costs

In this, one of the country's largest maintenance shops, American MonoRail Overhead Handling Equipment serves the entire department. Included in the department are: machine shop, electrical repair, metalizing room, welding, painting and sand blast room, pipe shop, and inside and outside storage. This plant has shown a definite increase in efficiency and a great reduction in handling costs.

Let an American MonoRail engineer show you how you can cut handling costs and save valuable floor space.

WRITE FOR C-1 BULLETIN

THE AMERICAN MONORAIL COMPANY

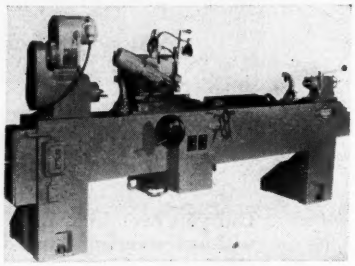
13102 ATHENS AVENUE • CLEVELAND 7, OHIO

supplied, or the unit can be used without guard rails for handling materials wider than 18 inches.

Broach Sharpening Machine

USE REPLY CARD—CIRCLE No. 11

Universal broach sharpening machine, made for sharpening round and flat type broaches, is announced by American Broach & Machine Co., Ann Arbor, Mich. Fixed machine bed offers two advantages: Broaches held in rigid position, with no chance for misalignment; reduced floor space requirement. Because the broach is held stationary, adjustments for sharpening are made with the grinding wheel spindle. The latter is mounted on a traversing carriage and equipped with micrometer adjustment. Spindle is driven by a 3600-rpm motor, with provisions for adaptation to 15,000-rpm.



. . . sharpens both round and flat broaches

For quick conversion to flat or surface sharpening, the company offers as optional equipment a Sundstrand magnetic Viking chuck with power unit and demagnetizer. To sharpen a surface-type broach, chuck is placed on the machine bed and broach positioned for grinding. Final adjustments are made with grinding wheel spindle micrometer controls.

Tank-Wall Transformer Bushing

USE REPLY CARD—CIRCLE No. 12

Distribution transformers with high-voltage, tank-wall bushings replacing the pocket-type are announced by General Electric Co., Schenectady 5, N. Y. Transformers have smaller dimensions, an improved gasket seal for insuring oil tightness. Insulated screw cap on the bushing permits connection without tools. Slot arrangement in the porcelain permits

you cut costs— improve your products with pre-coated Thomas Strip

Costs go down—product quality goes up, when you use Thomas *pre-coated* strip in stamping and drawing light-metal parts. Savings show up in almost every direction.

It has a clean, smooth-surface finish which eliminates the cost of preparation before fabrication. In many instances, all that is necessary is to fabricate and assemble, as cleaning, plating, and buffing operations are not necessary. Often the tightly adhering, non-ferrous coating serves as the final finish. The coating also acts as a die lubricant, increases die life, reduces wear and cuts re-tooling costs. It protects the base metal during manufacturing processes.

In addition to these many cost saving advantages, *pre-coated* Thomas Strip improves products by providing a uniform finish on products inside and out. It adds substantially to product life and appearance, at low cost.

To lower operating costs and increase product acceptance use *pre-coated* Thomas Strip. For assistance in selecting the most desirable coating for your products from the wide variety listed below, write today.

Cold-rolled strip steel electrolytically pre-coated with Zinc, Copper, Brass, Nickel, Lead-Alloy and Chromium in Natural, Planished and Buffed Finished—Hot Dip Tin and Lead Alloy Coated—Lacquer Coated in Colors—Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel. Carefully produced to your specifications.

Thomas Strip

a product of

Pittsburgh Steel Company

Thomas Strip Division · Warren, Ohio

a conductor to be brought in on either side of the bushing.

Redesign applies to the company's conventional type HS and HSBA transformers, 5000-v and below, 100 kva and below.

High Frequency Heating Unit

USE REPLY CARD—CIRCLE No. 13

Soldering, brazing, hardening and annealing are some of the controlled heat applications possible with an electronic high frequency heating unit introduced by Lewis Machine Co., 892-4 Newcomb St., St. Paul 6, Minn.

Unit has been designated as the model 1500. It is designed for use with either ferrous or nonferrous metals and does not require a skilled operator for maximum efficiency. Control is achieved by an automatic timer switch that can be preset from zero to 60 seconds. Coils and accessory equipment are available to meet an infinite range of heating applications. Preassembled or prepositioned parts can be heated while in motion on a conveyor or turntable.

Output is 1500-w into a standard NEMA load; frequency, 400,000 cycles; supply, 220-v, 60-cycle, single-phase. Both water and filtered air blower systems are employed for cooling.

Power Strap Dispenser

USE REPLY CARD—CIRCLE No. 14

Mill-type power strap dispenser, made by Signode Steel Strapping Co., Chicago, should speed volume use of heavier strapping material. Machine is built to handle ribbon-wound strap in ¾, 1¼ and 2-inch widths. It feeds strapping at a rate

. . . speeds volume use of heavier material

of 6 to 10 feet per second. Cutting requires about 2-4 seconds.

Operator places a strapping coil in the coil holder, feeding the end into position manually. Length of strap fed through cutter jaws is controlled by pushbutton. When proper length is reached, cutter handle is pulled toward the operator to complete the job. Tool occupies a 3 x 5-foot space, is 3 feet high.

Governing Brake

USE REPLY CARD—CIRCLE No. 15

Designed for use with electric or gasoline winches or similar power units, a governing brake is offered by St. Anthony Machine Products Co., Minneapolis, Minn. Operating on a centrifugal governing principle, it delivers a smooth gradual retarding action at any desired in-

GLOBE

SUPERIOR LADLE BRICK

Here is a plain statement without any frills: you can increase your melting capacity if you use GLOBE SUPERIOR LADLE BRICK. This statement has to be proved, of course, before it can be accepted at face value. Well, it's proved every day in steel plants all over the country. Here's how it works: the labor and materials used for refractory replacement are a terrific drag on production time. The excellent quality of GLOBE SUPERIOR LADLE BRICK, wire cut or dry pressed, makes it last longer. By lasting longer, it salvages much of the time lost in refractory replacement. The result, of course, is increased melting capacity. Let us help you select the right type of GLOBE SUPERIOR LADLE BRICK for your particular needs. You'll find it quite profitable.

SERVING THE STEEL INDUSTRY SINCE 1873

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

terval within a range of 900 to 4000 rpm and automatically checks speed of a free falling or free running load.

Toggle Bolt Assembly

USE REPLY CARD—CIRCLE No. 16

A toggle bolt is available from Super-Grip Anchor Bolt Co. Inc., Philadelphia 40, Pa., that may be installed with head of bolt outside the wall, with nut outside the wall or toggles may be purchased separately and used with any bolt. Toggle head is available for bolt diameters from ⅛ to ½-inch.

Goggles with Plastic Frames

USE REPLY CARD—CIRCLE No. 17

A safety goggle, featuring a transparent plastic frame is available from American Optical Co., Southbridge, Mass. It is designed for wear over the eyes or over spectacles.

Edge Tester Gages Plier Quality

USE REPLY CARD—CIRCLE No. 18

Edge-tester designed by Utica Drop Forge & Tool Corp., Utica, N. Y., is motor driven, feeding 0.080-inch hardened steel plow wire across cutters of an opening and closing pliers. In addition to cutting qualities, machine tests joint construction and material.

Reversing Drum Switch

USE REPLY CARD—CIRCLE No. 19

Class 2601, type A small reversing drum switches are offered by Square D Co., Milwaukee 12, Wis. Operating mechanism is convertible for maintained or spring return action. Screw type terminals are provided and terminal blocks with contact fingers are replaceable. The easily installed switch is for application where small motors are to be reversed manually.

Three Hand Grinders

USE REPLY CARD—CIRCLE No. 20

Three hand grinders for use with mounted wheels and points are introduced by Skilsaw Inc., Chicago 30, Ill. Model 137 is equipped with a 5/32-inch capacity geared chuck and has a speed of 20,000 rpm. Model 146 has same speed but comes with ⅛ and ¼-inch collet chucks. Model 148 has a speed

Save 68%

OF DOCK HANDLING TIME*

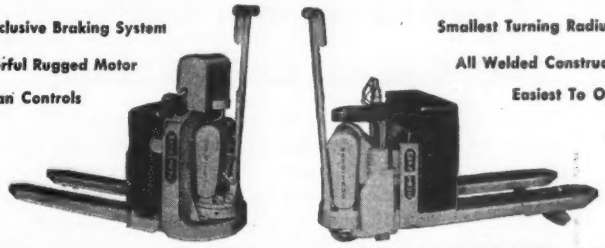
with MOTO-TRUCS

* "A U. S. Navy Materials Handling Laboratory estimates that mechanized handling can cut 68% of the man hours needed for loading freight cars."

A "twist of the wrist" does it.

One user of 8 Moto-Truc Walkies, reduced the man hours unloading a boxcar from 16 to 4. Viz:—One man with a Moto-Truc Pallet now does in 4 hours what formerly took 2 men 8 hours with former methods.

Exclusive Braking System
Powerful Rugged Motor
Dead-man Controls



Smallest Turning Radius
All Welded Construction
Easiest To Operate

MOTO-TRUC'S 6 BASIC MODELS ARE QUICKLY ADAPTABLE TO ANY PROBLEM IN THE WALKIE FIELD.

DON'T BE SATISFIED WITH LESS THAN THE BEST.

THE MOTO-TRUC CO.

1953 E. 59th STREET • CLEVELAND 3, OHIO
PALLET, PLATFORM AND HI-LIFT TRUCKS
LARGEST EXCLUSIVE MANUFACTURER OF "WALKIES"

SEND FOR Bul. No. 51

MOTO-TRUC Designers FOR THE INDUSTRY PATENTED

BARBER
COLMAN
B-C.CO.
Precision
JIG BORING
REAMERS
REAM HOLES WITHIN .0002"!
145 Sizes and Styles In Stock
Barber-Colman reamers for Jig Boring Machines assure holes to size within .0002". All diameters are precision ground, relative for runout within .0001". A complete range of sizes and styles is available from stock. Reamers are furnished with tang shanks or tapped for drawbolt, in either long or short styles, to suit your requirements.
WRITE OR PHONE FOR IMMEDIATE SHIPMENT
BARBER-COLMAN COMPANY
896 ROCK STREET
ROCKFORD, ILLINOIS

of 36,000 rpm and ⅛ and ¼-inch collet chucks.

Heavy Duty Universal Joint

USE REPLY CARD—CIRCLE No. 21

Curtis Universal Joint Co., Springfield, Mass., announces a heavy duty universal joint with 6-inch hub diameter and a length of 15½ inches (single joint) and 25 inches (double joint). Forks are cast of alloy steel; pins and blocks of cold drawn alloy steel.

Masonry Drill Bit

USE REPLY CARD—CIRCLE No. 22

Thunder-Twist carbide drill bit, developed by New England Carbide Tool Co. Inc., Cambridge, Mass., enables one man to drill holes in green concrete with an electric or pneumatic hammer. It has two deep spiral vanes that remove dust quickly. It is capable of drilling holes 3/16, to 1¼-inch diameter up to 36 inches deep.

Mercury Safety Switch

USE REPLY CARD—CIRCLE No. 23

For safety in hazardous, explosive locations, Tigerman Engineering Co., Chicago 26, Ill., offers a hermetically sealed mercury switch. Switch is set in operation by a selector knob or pushbutton that inclines the armature. Designed for vertical panel mounting, unit is a single-pole, with either single or double throw action.

Rotary Pressure Joint

USE REPLY CARD—CIRCLE No. 24

A rotary pressure joint designed to convey liquids and gases from a stationary pipe line to a revolving receptacle is announced by Seamlex Co. Inc., Long Island City, N. Y. It features external screw adjustment so that normal wear of the seal can be compensated for without removing the joint; float-

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

72. Motor Drive Accessory

Reliance Electric & Engineering Co.—Timed-rate acceleration and deceleration is provided by VSC electronic motor-drive accessory described in illustrated 2-page bulletin K-2025. Four functions are explained: time-rate acceleration and deceleration and speed-changing; preset speed selection; automatic speed-changing and improved speed regulation for adjustable voltage drives.

73. Industrial Machines

Rockwell Mfg. Co., Delta Power Tool Div.—64-page illustrated catalog AB-51 deals with complete line of industrial machine tools which includes band, circular and scroll saws; abrasive belt and disk finishing machines; deburring and cut-off machines; drill presses; grinders, jointers: wood lathes; wood and metal shapers; welders, motors and switches and miscellaneous accessories.

74. Electrode Oven

Philip Roden Co.—Facts you should know about DryRod electrode control are presented in 6-page illustrated folder on DryRod electrode ovens. These units, offered in three sizes and voltages, stop moisture pickup in mineral coated welding electrodes. Capacities are 12, 350 and 900 lb of electrodes.

75. Drop-Bottom Container

Roura Iron Works, Inc.—On the two pages of illustrated bulletin No. 101 you can read how Roura drop-bottom containers can save time, labor and worker fatigue in your plant. Features of the 48 x 36 x 39-in. containers which can be tiered are outlined.

76. Protective Coatings

Prufcoat Laboratories, Inc. — Entire line of Prufcoat protective coatings and chemical agents against which they have been found effective are covered in 4-page illustrated catalog "Stop Profit-Eating Corrosion." Case histories of five different types of applications are included. A guide helps determine the specific sealer, primer and finish material for any painting problem.

77. Casters & Trucks

Rapids-Standard Co.—Revised 36-page catalog CT-52 on "Rapistan Casters and Trucks" has photos and complete specs on casters and wheels designed to handle light to heavy loads on all types of floor surfaces. Selection of wheels shown include steel, rubber and plastic types with capacities ranging to 3500 lb. Also pictured and described are Wheel-Ezy hand and Stock trucks.

78. Literature & Movie Index

Reynolds Metals Co.—Design, fabrication, application, products and general information are headings of listings of available technical literature on aluminum and its effective use. This "Literature & Movie Index" also briefly describes seven sound and color motion pictures which are available for showing to metalworking executives and industrial groups.

79. Alternate Stainless

Joseph T. Ryerson & Son, Inc.—"Allegheny Metal Straight Chromium Grades as Alternate Selections for 18-8 Chromium-Nickel Stainless Steel" is title of 16-page illustrated booklet published by Allegheny Ludlum Steel Corp. Mechanical, corrosion resisting and other properties of 18-8 stainless are compared with a number of straight chromium analyses, principally type 430, indicating where the latter type can be used as a satisfactory alternate.

6-30-52

STEEL
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States
—POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

80. Melting Furnaces

Pittsburgh Lectromelt Furnace Corp. — 64-page illustrated catalog No. 8 is highly descriptive, presenting pertinent information on line of furnaces for melting and refining of iron, steel, nickel and copper. Operating costs and other data, typical installations and detailed specifications of furnaces for various applications are given.

81. Plastic Tubing

Reflin Co.—Lightweight, corrosion-resistant thermosetting plastic and Fiberglas-reinforced tubing is subject of 4-page brochure of engineering information. Tubing is suited for underground conduits; fuel, natural gas, irrigation or sanitary lines; shipboard piping systems; and housings for airborne equipment and components.

82. Liquid Drives

G. E. Nelson Co.—Contained in file folder 6000 is 8-page bulletin 6020, descriptive of traction type liquid drives for belt-driven, hub mounted and special installations; single-page bulletin 6040 which offers horsepower capacity, torque and speed charts; and from 6060 for recording application information.

83. Air Valves

Rivett Lathe & Grinder, Inc.—12-page illustrated air valve catalog 303 describes 19 different models of air valves. Data are given on hand, foot, solenoid, cam and pilot types as well as on speed control and sequence models. Made in ¼, ⅜, ½, ¾ and 1-in. sizes, valves control pressures up to 150 psi.

84. Gas-Oil Burner

Ra-Diant Heat Refractories, Inc.—Details of Explosion combination gas and oil burner as well as information on slot type forge furnace and small metal melting furnace are given in 12-page illustrated bulletin "Gas—Oil".

85. Pit Covers

Geo. P. Reintjes Co.—Described and illustrated in 4-page folder No. 352 are component parts of Reintjes pit covers. Pit roof is divided into three independent parts: the refractory protection for outer frame and shoe castings, the roof tiles directly over the coping and the central portion of the arch. Each part can be moved independently of the other.

86. Expanded Metal

Penn Metal Co.—Written on theme "how to make a little metal go a long way," 24-page catalog 493 EM shows and suggests numerous applications of expanded metal meshes. Emphasis is on savings of steel and critical metals while still providing free passage of light and air, and retaining the decorative effect.

87. Conveyor Chain

Rockford Products Co.—4-page illustrated folder shows types of conveyor chain that are made to your specifications in large or small quantities by this company. All rollers and bushings are hardened.

EDITORIAL REPRINTS:

88. Production Reaming

Finishes of 30 microinches are possible on many types of production reaming jobs. Requisites are adequate machines, tooling and tools, plus proper reamer sharpening. The proper techniques, tools and tooling for improving product finishes are discussed by F. R. Sund of Barber-Colman Co. in STEEL reprint "Production Reaming: Fine Finishes Faster."

89. Ultrasonic Inspection

Application of ultrasonics to inspection and measuring problems is growing. Value of tests depends upon the instrument operator and upon interpretation of data. R. H. Frank of Sperry Products Inc. in STEEL reprint "Ultrasonics . . . Inspection Applications Grow" gives fundamental facts on sound behavior in materials and describes many of today's testing applications using ultrasonics.

90. Blast Furnace Practice

The fourth of a series of informative articles on blast furnace practice by C. E. Agnew is now available in STEEL reprint form. Entitled "Beneficiation of Air—XI(c)," article emphasizes importance of effects of raw material chemical composition and blowing rate on the shaft raw material preparation capacity.

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

—POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL 6-30-52
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT.

ing rotary seal and pressure equalizing chamber.

Universal Nipple Chuck

USE REPLY CARD—CIRCLE No. 25

Designated "55", a universal nipple chuck capable of threading ⅛-inch to 2-inch pipe is introduced by Beaver Pipe Tools Inc., Warren, O. Adapters allow for all sizes from ⅛-inch to 1½-inch pipe. No adapter is needed for 2-inch pipe. An inserted pin retains sliding plunger in working position. Nipples are removed by hand.

Lagging for Conveyor Pulleys

USE REPLY CARD—CIRCLE No. 26

American Pulley Co., Philadelphia 29, Pa., announces Griplex Spiralagging for its line of solid welded-steel belt conveyor pulleys. Lagging is made from extra strong duck, with thick rubber facing and is applied in one continuous piece under tension.

Lineal Measuring Actuators

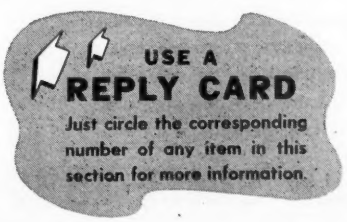
USE REPLY CARD—CIRCLE No. 27

Electric counter actuating switches equipped with wheels for lineal measuring of all kinds are announced by Production Instrument Co., Chicago 6, Ill. Each complete revolution of the wheels closes and opens the switch, providing the impulse necessary to register a count in an electric counter.

Automatic Time Calculator

USE REPLY CARD—CIRCLE No. 28

Tele-Vision Clock Corp. of America, Pittsburgh 8, Pa., offers an automatic time calculator. Model T.C. automatically calculates and registers each second, minute, 10 minute and hour time reading range 0:00 to 11:59. Second wheel, calibrated in seconds can be reset to zero starting time with start and stop switch.



How the "Waste Barrel" Test helps CUT FINISHING COSTS!

The primary purpose of the Jewel Brand "Waste Barrel" Test has been to help manufacturers cut finishing costs. How successful has it been? Let's take a look at the record. Three plants report as follows:

1. **A 25% production saving** in the finishing of stainless steel table knives.
2. **A 30% production saving** in the removal of welding beads on cold rolled steel boxes for tools, electronic parts and first aid kits.
3. **A 50% production saving** in the grinding and polishing of cold rolled stainless steel strip.

And these are but a fraction of the savings reported. More can and *will* be made! What about your plant, your department, your finishing operation? Is it equipped with properly selected abrasive belts for full operating capacity? Why not try the "Waste Barrel" Test and see . . . it only takes a minute and there are no obligations involved. Simply pick out a letter-size sample of used abrasive belt from your plant waste barrel (include the belt joint, if possible) and send together with completed coupon. In most cases, Jewel Brand Engineers can then recommend an abrasive belt that will wear longer, cut faster, and do a better all-around job. And *you* have nothing to lose, but high costs! Try it today!

Fill in coupon and send with used belt sample.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

We want to cut production costs! Enclosed is a sample of used belt from our plant.

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____

TYPE OF PRODUCTS _____ MATERIAL _____

WE USE APPROXIMATELY _____ BELTS PER MONTH _____

BELT LENGTH _____ BELT WIDTH _____

OLD SCRAP NEVER DIES

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. — DETROIT (ECORSE), MICHIGAN
READING, PENNA.
MODENA, PENNA. — PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICH.	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

TWO-THIRDS of your chances to order the major types of steel at regular prices for delivery in the fourth quarter of this year have been wiped out by the steelworkers' strikes.

Carryover of unfilled orders into the third quarter, which begins tomorrow, is equivalent to 11 million tons of finished steel, says the National Production Authority. This amount is equal to two months' output at capacity production.

The third quarter was already sold out, so it can't help wipe out the carryover. This leaves only the fourth quarter to take up the slack. Two months of that quarter will be needed to erase the carryover already accumulated. Thus, with two out of the three months in the fourth quarter committed for carryover, two-thirds of your chances for getting on the books for fourth-quarter delivery are shot.

SLIM CHANCE— Even the remaining one month does not offer much opportunity, because the equivalent of several days of it will be eaten up by preparatory work of getting the mills back into production once the strike is over.

There are some exceptions to the tight order books: Some premium price sellers can offer relatively early delivery when production resumes.

The steelworkers' three work stoppages this year cost the nation 9.1 million net tons of steel for ingots and castings up to yesterday.

SLOW PACE— The trickle of steel production that's going on in nonstruck mills dwindled again last week. A decline of half of a percentage point put STEEL's rate of ingot production at 12 per cent of capacity. This rate is equivalent to 249,000 net tons, compared with 2,091,000 tons in the last week before the current strike began.

While the steel supply picture grew blacker last week there were signs a break in the steel strike was nearer. The union retreated in some of its demands for a union shop, and a poll of steelworkers in one area in the Pittsburgh district indicated an overwhelming desire to accept the steel industry's offer and go back to work.

PRESSURE ON PRICES— One steel company which signed a new contract with an independent union last week estimates steelmaking costs will go up $10 a ton. The company expects to absorb part of the increase and ask the government for permission to raise prices to cover the rest.

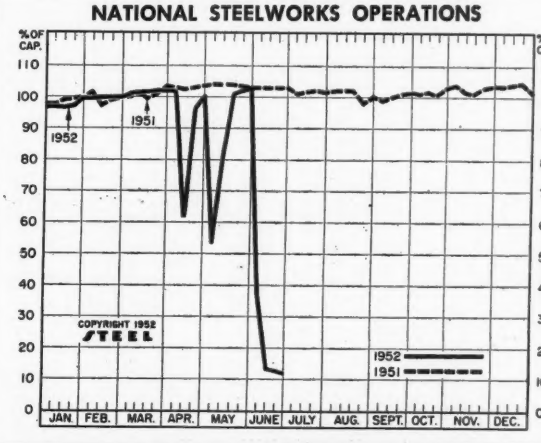
The strike is beginning to take its toll in production curtailments at steel consumers' plants. Cushioning the effects of the strike on consumers' steel stocks will be mass vacations of a week or two. Many of them will begin the last of this week.

UNPRODUCTIVE— The move to get finished steel out of struck mills and on its way to defense uses is not productive of much tonnage. Customarily, steel is moved promptly from the mill; thus little tonnage would ever be found there. What's more, the steel strike was expected, and every effort was made to ship promptly.

In addition to the pressure that the strike will put on demand for steel that can be produced the rest of this year, some new defense requirements will be felt. Beginning Nov. 1, hot-rolled sheets will be needed for airplane landing mat, storage tank and spiral pipe programs. Needs are reported to be 200,000 tons. Requirements of cold-finished bars for shell and fuze production are mounting.

SCRAP TUMBLES— Near cessation of scrap usage during the steelworkers' strike knocked down the prices on steelmaking grades of scrap last week. Dealers generally dropped their offering prices $3 to $5 a ton, but there were few takers. Before the strike, steel mills were becoming comfortably fixed with scrap. Since the mills have been closed, scrap has piled up in dealers' yards. The flow of industrial scrap will be choked down, however, as plants run out of steel or go on mass vacations. The break in steelmaking scrap prices lowered STEEL's price composite on steelmaking scrap to $41.50 a ton, a drop of $1.50.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended June 28	Change	Same Week 1951	Same Week 1950
Pittsburgh	2	0	99	100
Chicago	8	+ 0.5	106	102.5
Mid-Atlantic	16	— 3	102	98.5
Youngstown	0	0	105	107
Wheeling	51.5	0	98.5	100
Cleveland	0	0	100.5	70
Buffalo	0	0	104	104
Birmingham	0.5	0.5	100	100
New England	18	— 5	87	90
Cincinnati	32	—26.5	97	102
St. Louis	22	— 8	99	89
Detroit	37	+ 2	101	109
Western	33	0	105	99
Estimated national rate	12	— 0.5	103	101

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 35 Production-Engineering News—p. 75

Composite Market Averages

	June 26 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT ...	41.50	43.00	43.00	44.00	35.08

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	June 26 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.252	4.252	4.252	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia ..	3.93	3.93	3.93	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh ..	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh ..	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts. ..	4.10–30	4.10–30	4.10–30	4.10–30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.75	56.75	56.75	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila. ...	57.25	57.25	57.25	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	56.43	56.43	56.43	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts...	$44.00	$44.00	$44.00	$45.00	$34.75
No. 1 Heavy Melt, E. Pa...	38.00	42.50	42.50	43.50	36.75
No. 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	33.75
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	35.00
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	33.75
No. 1 Heavy Melt, Buffalo.	37.00*	43.00	43.00	44.00	33.50
Rails, Rerolling, Chicago...	52.50	52.50	52.50	52.50	40.50
No. 1 Cast, Chicago	45.00	45.00	45.00	49.00†	39.00

* Nominal. † F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connisvl. ..	$14.75	$14.75	$14.75	$14.75	$9.50-10.50
Beehive, Fdry, Connisvl. ..	17.50	17.50	17.50	17.50	9.75–12.00
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	15.00	15.00	19.50	17.50	10.50
Lead, St. Louis	15.80	14.80	14.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	106.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	39.00	39.00	39.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	56.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	56.43	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.17	54.67	54.67	55.17
Muskegon, Mich., del.	....	58.80	58.80	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.65	55.15	55.65	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.87	53.87	54.37
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	54.16	54.16	54.66
Verona, Trafford, del.	....	54.69	54.69	55.19
Brackenridge, del.	....	54.95	54.95	55.45
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.55
Troy, N.Y. R2	60.00

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, June 26, 1952; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ..$79.00
Munhall,Pa. U5 .....52.00
Seattle S24 .....73.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon,Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 ....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O. (29) T7 ....66.50
Conshohocken,Pa. A3..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.50
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ..3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.45
Lackawanna,N.Y. B2 ...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 .3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14.3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W. Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana, Calif. K1 .....5.55
Lackawanna,N.Y. B2 ...3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ...5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ...5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 .3.95
Ashland,l.c.l. (15) A10..4.45
Cleveland,c.l. R2 .....4.30
Warren,O.,c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2.....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ...4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 .....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13..4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8.....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass B5 .....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4 ..4.85
Huntngtn,W.Va.(3) W7..5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ....13.50
Dover(Wrght.Iron) U1..12.25
Economy,Pa.(S.R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Monessen,Pa. P7 .....4.30
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Portsmouth,O. P12 .....4.30
SanFrancisco S7 .....4.85
Seattle B3 .....4.60
So.Chicago,Ill. U5 .....4.35
SparrowsPoint,Md. B2 ..3.70
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 .....3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ..4.75
Williamsport,Pa. S19 ..5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah C11 .....3.70
GraniteCity, Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ..3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 .....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 ..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5 R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvanneale Steel

Canton,O. R2	5.25
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor, Ind. I-2 Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind Y1	5.85
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	Cu	Alloy	Cu	Fe
Ashland,Ky. A10	5.60		...	
Canton,O. R2	5.65		6.10	
Fairfield,Ala T2.	5.60		5.85	
Gary,Ind. U5	5.60		5.85	
IndianaHarbor I-2	5.60		5.85	
Irvin,Pa. U5	5.60		5.85	
Kokomo,Ind. C16.	6.25		...	
MartinsFy,O. W10	5.60		5.85	
Pittsburg,Cal. C11	6.35		...	
SparrowsPt. B2	5.60		...	
Torrance,Cal. C11	6.35		...	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.86
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cutlengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill. G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va.W6.	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea, O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	....	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	$15 10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)	$15 10.75
Pawtucket,R.I.(11)	N8.10.75
Pawtucket,R.I.(12)	N8.11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt, B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Muncie,Ind. I-7	8.75	9.00
Palmer,Mass.W12	8.85	9.10
Portsmouth,O.P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Muncie,Ind. I-7	8.70
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfordsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt, B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Muncie,Ind. I-7	6.45
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Muncie,Ind. I-7	9.10
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½Ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	209
Johnstown,17ga.,4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	122
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

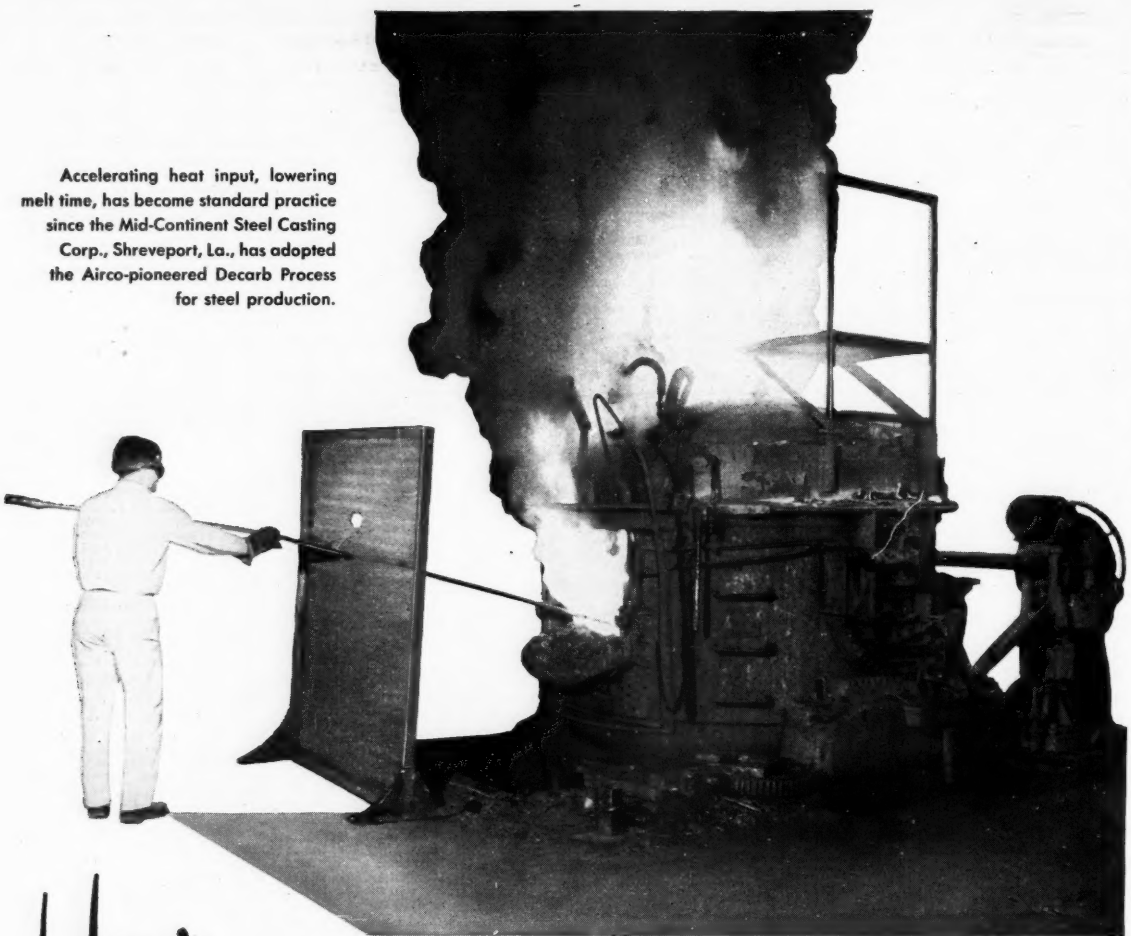
Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	19.5	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel products include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.35c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Undersized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.



Accelerating heat input, lowering melt time, has become standard practice since the Mid-Continent Steel Casting Corp., Shreveport, La., has adopted the Airco-pioneered Decarb Process for steel production.

How TO INCREASE STEEL PRODUCTION

use less power–save more time

WITH AIRCO'S STEEL DECARBURIZATION PROCESS

Oxygen injected under the slag cover at 80 psi has become the answer to Mid-Continent's faster steel production.

Increased bath temperature—faster carbon elimination—lower power consumption . . . time saved per heat . . . gives Mid-Continent a product with the same normal chemistry, slag control and fluidity as they formerly received using ore. Additional work-flow advantages are gained by the elimination of ore handling and storage problems.

Oxygen decarburization for faster heats may be put to work for you. The facilities of our Technical Sales Division may furnish you with the answers you need to know about this process for your use. If you are interested in obtaining further information, please address your nearest Airco office.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN AIR REDUCTION PRODUCT

AIRCO®

DEALERS AND OFFICES IN PRINCIPAL CITIES

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½ % on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜". Following make ½" and larger: Lorain, O. N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ½", 2 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates — Carbon Base 10%	Plates — Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets — Carbon Base 10%	Sheets — Carbon Base 20%	Sheets — Cu Base Both Sides
302 ...	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....
310 ...	36.50	41.00	....	....	....	144.00
316 ...	29.50	34.00	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....
318 ...	33.50	38.00	....	....	....	....
321 ...	26.50	31.00–32.00	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....
410 ...	20.75	27.25	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....
Inconel.	41.23	54.18	....	....	....	165.00
Monel..	34.93	46.28	....	....	....	....
Copper*	....	....	23.70†	29.65†	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅝-in.	18.5
¾-in. and larger	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ⅝-in./	12	6.5
¾-in.-1¼-in.	9	1
1⅜-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1¼-in.	12	2
1⅜-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅜-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅜-in. & larger	13	8.5
		Light
⅞-in. & smaller		35
½-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in.	34

Longer than 6 in.:

⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85c
⅞-in. under	36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	45.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	28.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg...26.00-33.00

Industrial xylol ..25.00-33.50

Per ton bulk ovens

Sulphate of ammonia..$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ...17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron:	Cents
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor - Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvil.fur.	$14.50-15.00
Connellsvil.fdy.	16.50-17.50
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass., ovens New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati,del.	25.23
Philadelphia, ovens	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.39
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.55 freight zone from works.

we never use crystal gazers.....

in the making of

WICKWIRE WIRE.....

Crystal gazers have no place in the making of Wickwire Wire. Our engineers and metallurgists work with the specialized know-how of long experience... maintain constant and careful control over every phase of production starting with the analysis and composition of iron in our blast furnaces and steel in our open hearth furnaces.

Rigid testing, checking and inspection — every step of the way — are your assurance that when you specify Wickwire Wire you can always count on unvarying uniformity of quality, size, tensile strength and stiffness.

We would welcome an opportunity to apply our skill and experience to the solving of any wire problem you may have. High or low carbon steel; round or shaped; in all tempers, finishes and grades — FOR THE WIRE YOU REQUIRE... CHECK FIRST WITH WICKWIRE.

For additional information write or phone our nearest sales office.

THE COLORADO FUEL & IRON CORPORATION — Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION — Oakland, California
WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

WICKWIRE WIRE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡[5]		Carbon	Floor
New York (city)	6.28	7.24	8.42	6.50	...	6.52	7.33	9.29	6.38	6.76	8.01
JerseyCity(c'try)	6.09	6.94	8.12	6.36	...	6.22	7.03	8.99	6.08	6.46	7.71
Boston (city) ..	6.40	7.20	8.51	6.32	...	6.25	7.12	10.80	6.40	6.60	7.84
Boston (c'try)..	6.20	7.00	8.31	6.12	...	6.05	6.92	10.60	6.20	6.40	7.64
Phila. (city) ...	6.09	7.05	8.25	6.29	7.19	6.35	7.19	10.50	6.11	6.38	7.32
Phila. (c'try) ..	5.84	6.80	8.00	6.04	6.94	6.10	6.94	10.25	5.86	6.13	7.08
Balt. (city) ...	5.74	7.04	8.40	6.27	...	6.25	6.87	...	6.37	6.33	7.61
Balt. (c'try) ..	5.54	6.84	8.20	6.07	...	6.05	6.67	...	6.17	6.13	7.41
Norfolk, Va. ...	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va. .	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.31	6.06	...	5.72	6.65	10.72††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.11	5.86	...	5.52	6.45	10.52††	5.82	5.98	7.35
Pitts. (w'hse)..	5.54	6.32	8.15	5.84	6.90	5.47	6.40	10.10††	5.65	5.70	6.89
Detroit (w'hse).	5.74	6.49	8.34	5.78	7.15	5.76	6.60	10.37††	6.12	6.17	7.23
Cleveland (del.)	5.74	6.52	8.01	5.85	7.14	5.81	6.60	10.41††	6.18	6.02	7.43
Cleve. (w'hse) .	5.54	6.32	7.81	5.65	6.94	5.61	6.40	10.21††	5.98	5.82	7.23
Cincin. (w'hse).	5.87	6.39	8.17	5.79	...	5.77	6.66	10.52††	6.12	6.17	7.31
Chicago (city)..	5.74	6.52	7.90	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.70	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.91	...	8.07	5.86	...	5.84	6.71	10.37††	6.02	6.07	7.26
Milwau. (c'try).	5.71	...	7.87	5.66	...	5.64	6.51	10.17††	5.82	5.87	7.06
St. Louis (del.)	6.04	6.82	8.20	5.99	...	5.97	6.90	10.60††	6.25	6.30	7.49
St. L. (w'hse) .	5.84	6.62	8.00	5.79	...	5.77	6.70	10.40††	6.05	6.10	7.29
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	8.64	9.50	7.95	...	6.70	9.13	10.35	6.52	6.91	8.73
SanFran.(w'hse)	6.44	7.88[3]	9.10[3]	6.42	...	6.32	8.20	11.30	6.30	6.43	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gage; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—450 to 1499 lb; [3]—500 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore
(1951 contract prices; 1952 prices not established)

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore
Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore
Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)—	30.00-31.00

Tungsten Ore
Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Rhodesian

45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, and 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: Min 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot, add 5c.

SILICON ALLOYS

25.30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12 % max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; less than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

* Government ceiling prices, effective May 7, 1951, f.o.b Niagara Falls, N. Y., basis.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 153 June 23 issue; manganese, titanium and "other" ferroalloys, page 203, June 16. Refractories prices were published on page 153, June 23.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

June 26	$41.50
June 19	43.00
May 1952	43.00
June, 1951	44.00
June, 1947	32.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than matherial suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross tons which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings.	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

OPEN MARKET

Birmingham

(Delivered)

No. 1 cupola cast	$42.00
Stove plate	37.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	32.00
Heavy breakable	30.00
Stove plate	30.00
Unstripped motor blocks	28.00

Buffalo

(Delivered)

No. 1 heavy melting	37.00*
No. 2 heavy melting	37.00*
No. 1 Bundles	38.00*
No. 1 busheling	38.00*
No. 2 bundles	37.00*
Machine shop turnings.	27.00*
Mixed borings, turnings	31.00*
Cast iron borings	31.00*
Short shoveling turnings	31.00*
No. 1 cupola cast	41.00-42.00*
No. 1 machinery cast	42.00-43.0*

* Nominal.

Chicago

(Delivered)

No. 2 heavy melting	38.50
No. 2 bundles	38.50
Machine shop turnings.	26.00-27.00
Mixed borings, turnings	31.00-32.00
Shoveling turnings	31.00-32.00
Cast iron borings	31.00-32.00
No. 1 cupola cast	43.00-47.00
Charging box cast	39.00-41.00
Heavy breakable	36.00-38.00
Burnt cast	36.00-38.00
Cast iron brake shoes	40.00-41.00
Stove plate	36.00-41.00
Clean auto cast	43.00-45.00
Unstripped motor blocks	33.00-35.00
Malleable	48.00-50.00
Drop broken machinery	45.00-50.00

Cleveland

(Delivered)

No. 1 cupola cast	44.00

Detroit

(Brokers' buying prices; f.o.b. shipping point)

Machine shop turnings.	24.00-25.00
No. 1 cupola cast	43.00-44.00
Heavy breakable	39.00
Clean auto cast	46.00-47.00
Unstripped motor blocks	36.00-37.00
Drop broken machinery.	46.00-47.00
Stove plate	42.00-43.00
Charging box cast	43.00

New York

(Brokers' buying prices; delivered consumers' plants)

Cupola cast	38.00
Unstripped motor blocks	34.00

Philadelphia

(Delivered)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	38.00
No. 2 bundles	32.00
No. 1 busheling	30.00
Mixed borings, turnings	30.00
Machine shop turnings.	28.00
Short shoveling turnings	30.00
No. 1 cupola cast	38.00-39.00
Unstripped motor blocks	35.00
Heavy breakable	42.00
Machinery cast	43.00-44.00

Pittsburgh

(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00

San Francisco

(Delivered)

No. 2 bundles	30.00
No. 1 cupola cast	41.00

Seattle

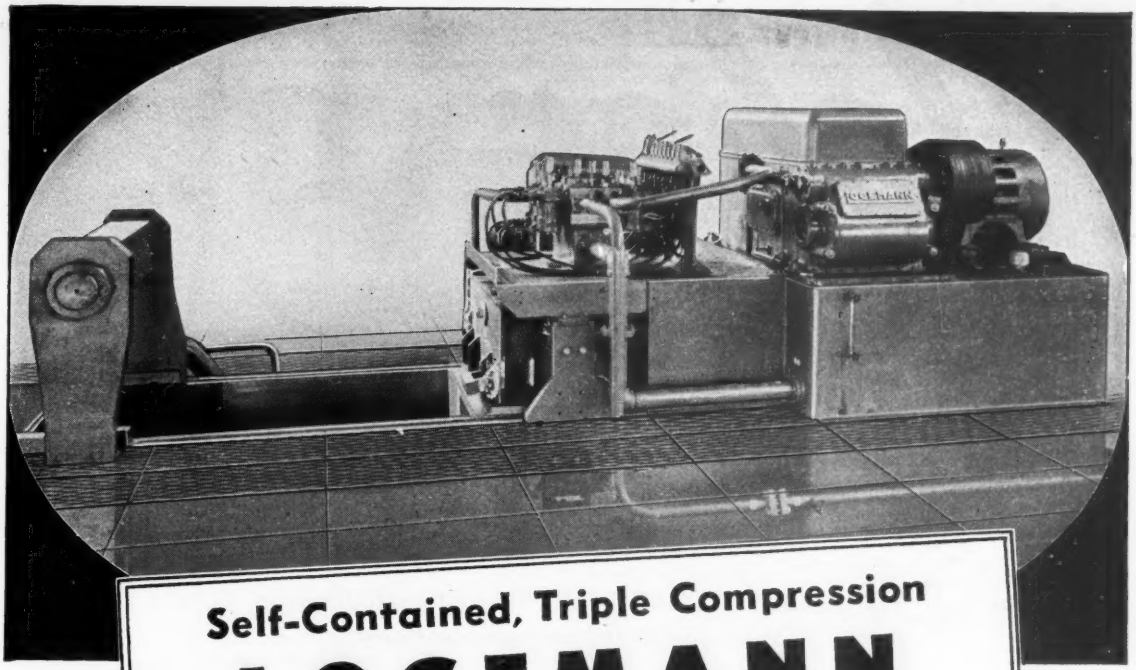
(F.o.b. shipping point)

No. 2 bundles	29.00
No. 1 cupola cast	44.00
Heavy breakable	40.00

St. Louis

(Delivered)

No. 1 cupola	41.00
Stove plate	39.00
Unstripped motor blocks	35.00



Self-Contained, Triple Compression

LOGEMANN SCRAP PRESSES

. . . give you compact, high density bales . . . at low cost!

LOGEMANN

Also specializes in

WASTE PAPER BALERS

for Industrial Applications

and in

HIGH PRESSURE PUMPS

. . . for pressures from 2000 to 50,000 p.s.i. for press operation, hydrostatic tests, and similar applications.

You Conserve Floor Space and Piping with this Compact Installation

Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

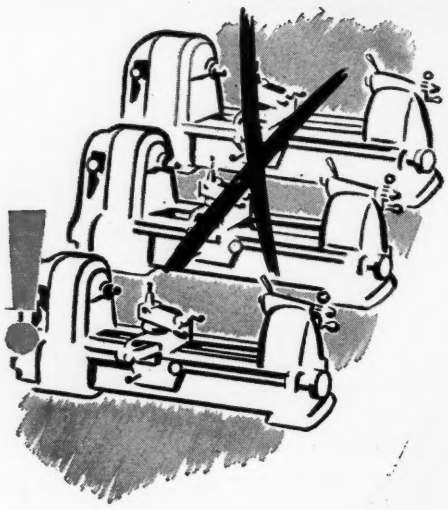
Also available are various sizes and types of pumps and operating valves to meet output requirements. Logemann Scrap Presses can be equipped with loading hopper in which the scrap charge can be prepared while the press is going through the operations on the preceding bale. Compressed bales are delivered at floor level for ejection to conveyor, steel chute, or into accumulation pit.

Write for Complete Details

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Labor SAVING!



with 854 sizes of . . . stock bearings for all applications in machine tools and industrial machinery.

with 324 sizes of . . . replacement bearings for all popular sizes and makes of electric motors.

with 263 sizes of . . . completely machined tubular and solid bronze bars.

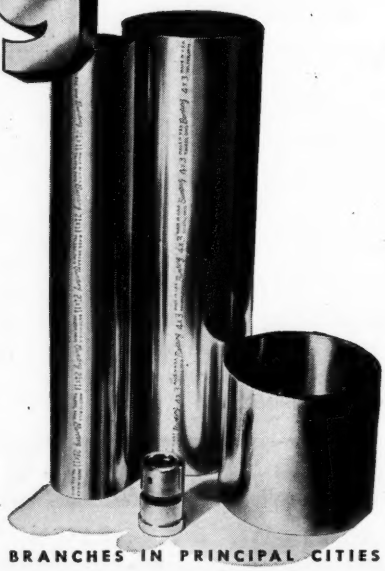
Hundreds of different sizes of Bunting Bronze bearings and bars make it easy to select a size that fits the job.

Bunting®

BRONZE BEARINGS • PRECISION BRONZE BARS • BUSHINGS

. . . IN STOCK EVERYWHERE

Bunting products are instantly available in all markets, from the stocks of leading industrial distributors and distributors of specialized industrial items. Ask your distributor or write for catalog.



THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

The Metal Market

New Era in Marine Construction

When the *S.S. United States* takes its permanent place in the sea-lanes this summer it will be carrying more aluminum in its structure than any other ship afloat. Millions of pounds of the light metal were used in more than 60 applications, including the 600-foot-long superstructure and over 1.5 million rivets. Aluminum Co. of America development engineers say the $70-million *United States* marks "a new era in large-scale use of aluminum for marine construction"

There's nothing static about the nonferrous market. Price movements are widely divergent: Lead goes up, copper firms at higher levels, while zinc remains in the doldrums

INDUSTRY's summer lull is supposed to set in about this time, but you can't prove it's here by the current gyrations in the metal market.

Most noticeable trends: The surge of lead buying that started prices upward again, the firming of copper prices at higher levels and the pall that's settled over zinc with the steel strike.

Mass Psychology—Upswing in lead is only temporary. Stocks hit bottom as users sweated out another price dip. Nearly everyone ran out of lead inventories about the same time and flooded the market with orders, precipitating the most active buying of the year. Dealers are charging what the traffic will bear, but aren't limiting orders.

Actually, there's plenty of lead around. For all the heavy buying, few big orders appeared. Demand for lead products is described as "just fair." Smelting charge on battery plates is down $5 to $45-$50 range.

Another Tumble—For the next 30-60 days lead prices may hold or even go higher. Then they'll settle again. A surplus this year is almost certain.

Largest users of the heavy metal, battery makers, don't have a Chinaman's chance of turning out the 30-million plus units predicted for this year. In the first five months only 5 million batteries were produced. Physical capacity isn't great enough for the 2-million-unit-a-month clip needed to reach the goal.

Copper Prices Vary — Considering the complicacy of OPS's new pricing standards, copper prices are settling quickly at their new and higher levels. Foreign quotations still vary a bit though and fabricators are shopping around before they place their orders. The British, for example, are buying from Canada and Rhodesia at 33.00 cents a pound f.a.s., New York. Belgian copper is quoted at 32.87 cents f.ob. Antwerp. Chilean copper is selling at 36.50 delivered Connecticut valley.

Canadian copper price is now set at 29.5 cents a pound in Canadian funds f.o.b. Toronto and Montreal. New price was announced by Canadian Copper Refiners Ltd. and Consolidated Mining & Smelting Co.

Adjustments for All—Upward price adjustments in copper products will apply not only to mill but also to fabricated products, says OPS. A study is now under way to determine an industry-wide across-the-board adjustment to allow for the increase in brass mill products costs. For example, the stamping industry will be allowed an increase in its ceiling prices to help compensate for the scheduled price increase on brass sheets.

Companies not satisfied with the adjustments for whole industries may compute their new prices on the basis of GOR 29, issued last month.

OPS copper price action, effective June 25, exempts from price control not only all sales of foreign primary copper but also copper refined from imported ores, concentrates and imported raw materials, including scrap.

Copper Allocated for July

First government allocation of copper since the new price agreement between the U. S. and Chile is 133,333 tons for July. Sixty per cent of this amount is to come from domestic sources and the other 40 per cent from foreign. The 133,333 tons are to be allocated this way: 62,211 tons to brass mills, 63,722 to copper wire mills and 7400 tons to foundries. In addition, 4000 tons from foreign sources will go to exporters.

Aluminum: A Political Football

The aluminum expansion program is becoming more and more a political football, as congressmen get in the act. NPA probably wishes it hadn't even suggested the whole thing. The issues lie deeper than who is going to supply the aluminum. NPA evidently wants to bolster the independent fabricators — weak link in the domestic aluminum industry — by guaranteeing them an ingot supplier that doesn't compete with them in the U. S. market. In support of expansion at home, one senator boldly claims that "a new process has been developed by which steam plants, using coal, can generate power to smelt aluminum and other metals at a cost equal to or below that of plants using water power."

Nonferrous Briefs

A flurry of strikes is hitting Connecticut valley brass mills (p.45) . . . Seamless molybdenum tubing prices were cut from 11 to 46 per cent by Fansteel Metallurgical Corp. . . . Aluminum foil converters have substantial inventories of foil and acetate rolled to quartermaster specifications that they can't get rid of or use. Quartermaster requirements are negligible now and only 20 per cent of anticipated military orders came out.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.35c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4,18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$198 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.25 del.; special or patented shapes $2.40.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 82.75c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.48; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4 17S-T4	R-317-T4	——Hexagonal—— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $20.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $20.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 21.25c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 22.50c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb. 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Choride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 12.00-12.25; battery plates 7.00-7.50; linotype and stereotype 13.50-14.00; electrotype 12.00-12.50; mixed babbitt 14.50-14.75.

SMELTERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Zinc: Old zinc, 8.75; new die cast scrap, 8.50; old die cast scrap, 8.50.

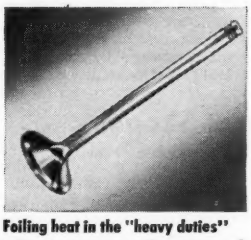
DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 24-26	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.75
June 23	24.50	15.30	15.00	121.50	19.00	39.00	56.50	82.75
June 18-21	24.50	14.80	15.00	121.50	19.00	39.00	56.50	82.75
June 5-17	24.50	14.80	16.00	121.50	19.00	39.00	56.50	82.75
June 2-4	24.50	14.80	17.50	121.50	19.00	39.00	56.50	82.75
May 28-31	24.50	14.80	19.50	121.50	19.00	39.00	56.50	82.75
May 20-27	24.50	14.80	19.50	121.50	19.00	39.00	56.50	84.00
May 16-19	24.50	14.80	19.50	121.50	19.00	44.00	56.50	84.00
May 15	24.50	14.80	19.50	121.50	19.00	44.00	56.50	85.00
May 13-14	24.50	14.80	19.50	121.50	19.00	44.00	56.50	86.00
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	85.356
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

EARMARKED

for the plant that wants to lead the field with new products



Foiling heat in the "heavy duties"

"To improve performance of heavy duty truck and diesel engines, we need a new steel to resist cutting action and warpage of valves caused by hot exhaust gases." **A•E•Service** answered customers' needs with another "first," Carpenter 21-12N Valve Steel to provide new competitive advantages in engine performance.

Giving stainless a new "personality"

Problem as thrown at **A•E•Service** by Carpenter customers: "Give us a *different* stainless we can machine easier, faster, at less cost." Solution: The first Free-Machining Stainless, invented by Carpenter years ago. Once again, Carpenter customers were *first* to benefit.

Yours may be one of the plants that is developing new products for more sales and profits. If so, you'll find you can benefit in many ways from Carpenter's **A**pplication **E**ngineering **S**ervice.

A•E•Service is Carpenter's way of helping you fit the right specialty steel to the job. And in the process, it goes many steps further in helping you come up with a *better* product, and ways to produce that product faster at lower cost.

That's why it's second nature to a Carpenter man to ask about the job requirements when you order steel. He's not being nosey. It's *his job* to make sure you get a steel that produces more than just "desired results." That's **A•E•Service**. Quite often, this requires drawing on the added experience of his teammates back in the Mill laboratory. If "tailoring" steels will help, that's **A•E•Service**, too.

Many times, when the customer is satisfied with results, we're not. To us, it's a constant challenge to help improve "established" products, make possible new products, and save vital man-hours in the bargain. That is why so many improvements constantly come from Carpenter laboratories to make possible the impossible of yesterday. It's a habit with Carpenter **A•E•Service**.

keeps you ahead of competition

THE CARPENTER STEEL COMPANY • READING, PA.

Pioneers in improved Tool, Alloy and Stainless Steels through continuing research

Sheets, Strip . . .

Sheet and Strip Prices, Page 119 & 120

Pittsburgh—A whopping carryover into fourth quarter is certain to bring a blossoming in sheet conversion deals. Tonnage of sheets lost to date is estimated at around 2 million tons, roughly a full month's production. Except grades used in appliance fractional horsepower and automotive motors the sheet and strip picture, including specialty grades, looks dark for the rest of this year. A further complication is that the landing mat, storage tank and spiral pipe programs for the defense effort are slated to be launched about Nov. 1. These programs will boost defense sheet consumption which was taking only 10 to 15 per cent of output prior to the steel strike. Only one steel company in the district is still accepting orders forwarded from district offices. Even this company sends out only an acknowledgment of receipt with a letter stating delivery date will be forwarded when production is resumed.

Boston—Volume of narrow cold-rolled strip produced is dwindling as stocks of hot-rolled with converters become depleted. Consumers of flat-rolled are also running short of material and some have curtailed operations further.

New York—Approach of the vacation season has done much to relieve the pressure for sheets. A number of consuming plants will be down the first two weeks in July and while some have not been any too busy at best, the all-out suspension at various plants will reduce needs to the lowest point in months.

Philadelphia—Various sheet consumers are beginning to suspend operations this week for mass vacations. Some are influenced in this action by the growing shortage of steel. Recently the Budd Co. laid off 4500 employees at the Red Lyon plant, which is normally engaged in the manufacture of automotive components and railroad car equipment. This week employees are being laid off in some departments at its Hunting Park plant, given over largely to the manufacture of automotive components.

Cleveland — Plant shutdowns for vacations may be extended in certain cases where steel stocks are so low or unbalanced as to make resumption of manufacturing impracticable. As a general thing, supplies of flat-rolled items, while shrinking, are more plentiful than other products. The lack of other products and components entering various finished goods, however, will hamper manufacturing. The loss of sheet production in the strike, now amounting to roughly about six weeks' output, will tighten supply conditions noticeably in the last half of the year.

Chicago—Users of sheets continue to whittle down their stocks. From here on curtailment in manufacturing schedules, in some cases plant closings, will mount rapidly. Two biggest closings announced so far are Hotpoint Inc., and International Harvester Co. The former stopped all civilian production June 23 with resumption to come the day the steel strike ends. Harvester's closing, beginning June 27 in various plants, will be for two weeks or longer. Disposition seems to be to suspend or curtail before supplies are exhausted completely, this to assure balanced operations upon reopening, and until mill shipments can be counted upon.

St. Louis — Sheet consumers, deprived of new supplies, predict present stocks will hold out another two weeks. Despite production uncertainty, most continue placing normal orders, with the result mill backlogs are up sharply with few offsetting cancellations. Mills report inquiries for conversion ingots are increasing.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 119

Los Angeles—Hurting fabricators more than the steel strike is the complete shutdown of more than $250 million worth of defense and commercial construction projects by AFL engineers and ironmakers.

Seattle—As the steel strike wore on, rolling mill sales executives reported reduced inquiry for steel products.

Steel Bars . . .

Bar Prices, Page 119

Cleveland—Equivalent of six weeks production already has been lost as result of the steel work stoppages in April, May and June, and indications are unless the strike is quickly ended there will be little, if any room on bar mill books for fourth quarter business. Bars, especially the larger sizes, were in critically short supply before the June work stoppage, a heavy carryover from second to third quarter being indicated. The loss of tonnage in June has further enlarged this carryover which now is likely to take up the better part of third quarter output even though the mills quickly resume production. Producers last week were in receipt of telegrams from the National Production Authority advising them that the opening of books for acceptance of fourth quarter business may be deferred for 15 days following termination of the strike. Ordinarily, mill order books for the period would be opened on July 1. The extension, made to allow the mills sufficient time to restore operations and reschedule production in accordance with requirements of the defense program, will permit for the scheduling of prior booked business before the mills become definitely committed on new tonnage.

Boston—Cold-finished bar converters are curtailing production due to lack of hot-rolled. Best remaining inventory is between three and four weeks, but range in sizes and grades is narrowing. Bulk of volume with cold-drawn mills is 2-in. and under, but many inquiries are turned down. Two plants down by strike may ship defense orders on hand at time of stoppage against higher designated defense symbols. Forging demand, also small arms, is mounting while Watertown arsenal wants 5000 tons of carbon bars for remelting.

New York—Except for alloy bars, hot bar producers have not opened books for fourth quarter nor are they likely to until the steel strike ends. Consumers generally are cognizant of the position of the mills, but nevertheless are contacting suppliers more frequently as to prospects and particularly with a view to getting set up for fourth quarter on a tentative basis. The mills show little disposition to make even tentative promises.

Philadelphia — Forge shops, tool plants, agricultural equipment manufacturers and others are curtailing because of the bar shortage. Only one cold drawer in the district has been forced to suspend for this reason but other manufactruers are beginning to feel the pinch. Many manufacturers of consumer durable goods are worried over the supply outlook for the remainder of the year.

Pittsburgh—Bar users, particularly those requiring sizes 1½-inches and larger, have little cause for cheer. Producers say it is a little too early to be certain but the chances for getting on fourth-quarter books are almost gone. Some material will come out of strikebound mills for the favored programs but it won't make much of a dent in the demand. Since only one cold drawer is operating in the district and this plant is due to shut down for vacation during the first two weeks of July, the material coming out of mills will probably be diverted to other geographic areas for finishing.

Chicago—Barmakers not affected by the strike are finding more of their production earmarked by the government for direct defense end-use. Most is for July shipment although June figures in to some extent depending upon grades and sizes in current rolling cycles. Cold-finishers are finding their receipts of hot-rolled bars slowing down and future operations are threatened beyond the already shortened work-week.

Structural Shapes . . .

Structural Shape Prices, Page 119

Philadelphia—Award of 2000 tons for a heat-treating building for the Army ordnance plant at Birdsboro, Pa., is outstanding in an otherwise quiet structural market. Most fabricating shops have enough work to keep them busy, their major concern being sufficient steel to operate. Stocks are becoming unbalanced. Phoenix Iron & Steel Co., Phoenixville, Pa., closed down its open-hearth department last week for a week for vacations and repairs, and will close down its rolling mills as of the beginning of this week for at least a week. The company's bridge shop will continue in operation for the present.

Boston—Bridge estimates, plus defense inquiry, are in excess of current closings on structural steel contracts. Lack of plain material, beginning to slow down fabricating shops, will delay some projects already barely on schedule.

New York—Withdrawal by the government of plans for lifting restrictions on commercial building work choked off much potential demand for shapes. This action comes as a result of the steel strike, which also is reflected in other disrupting ways.

Chicago — Shortage of structural steel, made acute by the steel strike, is causing architects and engineers to switch as much construction as possible to reinforced concrete or

wood alternates. Reinforced concrete requires less total steel as compared with structural design, but, unfortunately, reinforcing steel products are in short supply too.

San Francisco—Millions of dollars of projects, including freeways, airports and sewage treatment plants in northern California have been held up for more than two months as a result of a strike of the AFL Pile Drivers Union.

Seattle — Fabricating plants are spreading remaining stocks as far as possible until mills resume and fresh shipments of materials are available. Operations will shortly be curtailed because of lack of inventory.

Plates . . .

Plate Prices, Page 119

Philadelphia — Strike-bound plate mills at request of the government and through arrangements with the union, are moving tonnage already processed against high-rated orders taking symbols A to E, excepting D, and Z-2 and B-5. Program for producing and processing steel at struck plants for special highly critical requirements has not yet got into operation. Alan Wood Steel Co., Conshohocken, Pa., which has a union contract, closed down its specialty mill last week for two weeks for mass vacations and closed down its plate mill this week for a similar period with resumption scheduled for July 14. Its continuous strip mill will close July 3 and resume July 14. The blooming mill is scheduled for two turns for a period of six weeks instead of the usual three. Openhearth operations will be sustained. Central Iron & Steel, Harrisburg, Pa., the only other eastern plate mill not strike-bound, is suspending operations for a week at a time in major departments on a stagger system. Lukens Steel Co., Coatesville, Pa., down because of the strike, is taking the occasion to conduct a supervisory training course.

Boston—Help some plate fabricators received under Z-2 in obtaining heavy sizes for highly rated defense work, machine tools and weldments for mill machinery, is being nullified by loss in production. There isn't enough steel in heavy gages to go around and shops are depleting inventories without lowering order backlogs. Consumer stocks of light gage plates average somewhat larger, but users also are banking on reserves. Supply will be stretched out by vacations, but shops are more cautious in starting new fabricating work without better balance in plates and components.

New York—Plate fabricators, particularly tank and boiler shops and railroad car shops, are being seriously pinched for plates. Mass vacations at a number of plants over the next two weeks will help relieve the tension but there is serious concern as to their ability to resume normal operations once vacations are over.

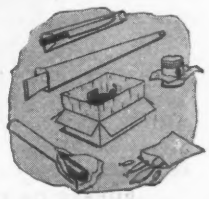
Pittsburgh — There may be no fourth-quarter plate bookings unless the steel strike ends soon. Third-quarter books were comfortably full and there would have been about a month's carryover from the second if there were no steel strike. The current strike already has the plate mills

HOW NOX-RUST VAPOR-WRAPPER SAVES $15,000 PER YEAR FOR A LEADING MANUFACTURER*

Through use of an amazing new rust-preventive product . . . Nox-Rust Vapor-Wrapper . . . one of America's leading manufacturers* estimates that it has saved over $15,000 each year for the last two years in packaging costs alone. What's more, approximately 6,250 man-hours per year have been saved in the elimination of previous preservative packaging methods. Units now packaged in Vapor-Wrapper arrive clean, "factory-fresh," rust-free and ready for instant use. Thus, large savings in set-up time are made possible.

INDUSTRY SWITCHES TO VAPOR-WRAPPER

Vapor-Wrapper eliminates the need for application and removal of messy, old-fashioned rust-preventive coatings. Because of this fact, leading makers of automotive and aeronautical parts and equipment as well as other vital segments of the metal-working industry have switched to Vapor-Wrapper. For details on how your firm can benefit with Vapor-Wrapper, just mail the coupon below. You'll receive full information without obligation.



* Name on request

CAUTION . . . Only Nox-Rust makes the exclusive new Vapor-Wrapper that's impregnated with Cellex . . . the patented VOLATILE CORROSION INHIBITOR. (U. S. Patents 2,521,311—2,534,201—other patents pending).

Just Mail This Coupon (Please attach to your letterhead)

NOX-RUST CHEMICAL CORPORATION
2423 S. Halsted • Chicago 8, Illinois
Detroit • Baltimore • Philadelphia
San Francisco • Los Angeles

NOX-RUST Chemical Corporation
2423 South Halsted
Chicago 8, Illinois
Please send me full information on how my firm can benefit through use of Vapor-Wrapper.

Your Name_____

Address_____
(If different from letterhead)

City_____ State_____

more than two months behind schedule and the situation is worsening rapidly. Optimistic reports about the amount of relief expected from "liberating" steel in struck plants are not well founded on fact. Only a little material destined for either direct defense, atomic energy or machine tools is left in the plants since the steel companies move the material to consumers quickly after finishing. One producer has a carload of plates that needed only approval from a Navy inspector prior to shipment but quantities like this one are definitely the exception.

Seattle—Inquiry for plates is active. Several sizable awards are pending, depending on settlement of the strike.

Wire . . .

Wire Prices, Page 121

Boston—As stocks of rods shrink with nonintegrated wire producers, less tonnage is available to consumers. Most of the latter have been dipping into inventories. Vacations will temporarily halt this with many. Producers of high carbon wire are better off on rods than are low carbon wire converters, although in both cases a growing number of sizes and grades are not available. Certificates of necessity for accelerated tax amortization approved for the wire industry are for the most part to cover equipment for production of special products. Latest is Cheney Bigelow Wire Works, Springfield, Mass., for increased production of fourdrinier wire.

Tubular Goods . . .

Tubular Goods Prices, Page 123

Chicago—Price reductions ranging from 11 to 46 per cent on seamless molybdenum tubing have been announced by Fansteel Metallurgical Corp., North Chicago, Ill., effective June 19. In its price list ninety-one standard diameters and wall thicknesses are listed, the outside diameters ranging from 1/16 to 1-in. Seamless molybdenum tubing has been produced by Fansteel on a commercial scale since 1950.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 123

Pittsburgh—Foundries are little concerned about coke stocks since pig iron inventories are the more pressing problem. A good supply of coke is on track awaiting resumption of steelworks operations. this condition makes price advances unlikely immediately after resumption of steelmaking, although generally rising costs may eventually force coke producers to petition for price increases over current ceilings. Connellsville beehive foundry coke is being quoted in the $16.50-$17 range.

Pig Iron . . .

Pig Iron Prices, Page 118

Cleveland—Resumption of production at the two Toledo stacks of the Interlake Iron Corp. following ending of a 9 weeks' strike by AFL union employees removes some of the threat of a pig iron shortage this summer. Both stacks are expected to be back in full production sometime this week. However, Interlake's Chicago furnaces still are strike-bound, these stacks being manned by CIO union members. Pressure for merchant iron is not as strong as might ordinarily be expected in view of the loss of production due to the strike. This, however, is accounted for by the fact many foundries are closing down for vacations and hope to replenish inventories during the period of shutdown. Also, not much improvement in castings demand is reported by those foundries that have been operating on curtailed schedules for some time past.

Boston—Prices for Mystic furnace pig iron are unchanged for third quarter, No. 2 foundry $59.75, Everett furnace, and malleable $60.25. These prices are based on December-January costs, the furnace not making the required 13,000 tons in any one month in the March-May period. For six weeks the unit was down for repairs.

New York—As a number of district foundries will be going down this week and next for mass vacations, movement of pig iron here will drop further. Operations already had declined as a partial reflection of the steel strike, and pressure for iron continued to ease. Now, with many foundries closing completely, the downtrend will be still more pronounced.

Pittsburgh—Vacations are the only thing that will save some foundries in this district from closing due to an iron shortage. The larger plants with a lot of defense work are scraping the bottom of the barrel but a few smaller establishments whose operations have been depressed have more than adequate stocks of raw material. In scattered instances jobbing shops working off their backlogs of large steel mill castings are encountering a storage problem. Ingot mold shortage threatens to hamper full steelmaking operations after the steel strike ends.

Chicago—Gray iron foundries view their pig iron supply with more concern but enough tonnage is on hand in most cases to meet melting requirements until mid-July. Many foundries are closing for a two week vacation period following July 4.

Iron Ore . . .

Iron Ore Prices, Page 125

Cleveland — Lake shippers are awaiting a break in the deadlock between the CIO steelworkers and the steel industry to permit resumption of Lake Superior iron ore shipments. Delay in accumulating stocks at lower lake ports and furnaces for use in the winter months becomes more serious each week and will become critical if continued much longer.

Shipments for the week ended June 23 dropped to only 93,703 tons compared with 2,967,765 tons for the like week a year ago. This brought the season's cumulative total to 21,443,993 tons, a decrease of 7,119,310 tons from the total for the like 1951 period.

...make gloves last 3 to 5 times LONGER!

THIS IS WHAT "WASH-RITE" DOES...

Throw *all* your dirty, worn leather, rubber or cotton gloves in our steel drum. Ship to us. We correctly clean, sterilize, *COMPLETELY REPAIR*, sort, reshape, pair and ship them back to you as serviceable as new. Depending upon the gloves and their usage, gloves are being re-claimed by us 3 to 5 times. We specialize only in laboratory controlled re-claiming of rubber, leather and cotton gloves, aprons and clothing. *Write for literature.*

10 Years of Proven Service

YOUR GOODS FULLY INSURED . . . WORK GUARANTEED

. . . it costs you nothing to find out. SEND US A FREE TRIAL ORDER

Wash-Rite Company, Inc.

1412-26 CORNELL AVENUE · INDIANAPOLIS 2, INDIANA

Scrap . . .

Scrap Prices, Page 126

Boston—Steel scrap shipments are small, but at ceiling prices with the exception of blast furnace grades. Chemical borings also are soft. Cast demand, light for some time, has all but disappeared with the foundries suspending for mass vacations. Yards are paying lower prices for cast.

New York—Distress lots of steel scrap are being offered at reduced prices but with too little business to provide a test of the market. Brokers regard steel scrap prices as being "all over the lot". Cast grades are fairly steady at recent levels.

Buffalo—Steelmaking grades of scrap joined the downswing in prices with declines of approximately $5 per ton. Dealers are quoting blast furnace grades off another $1, making the open market $6 under government ceiling levels. The break in the market occurred with dealers' yards jammed with material, making it difficult to handle the additional receipts. Dealers also are seeking protection against a possible weaker market when the steel strike ends. Mill buying currently is absent so that current quotations are based on dealer activity with No. 1 heavy melting $37, No. 2 heavy melting $37, No. 1 bundles $38, No. 2 bundles $37, machine shop turnings $27, mixed borings and turnings $31, cast iron borings $31, short shoveling turnings $31, cupola cast $41 to $42, No. 1 machinery $42 to $43.

Philadelphia—Market on steel scrap has broken here, prices on various grades dropping several dollars a ton in most cases. No. 1 heavy melting steel, No. 1 bundles and No. 1 bushheling are holding at $38 delivered, including the $1 brokerage fee. No. 2 heavy melting is quoted at $36, No. 2 bundles at $32, blast furnace borings and turnings $30, machine shop turnings $28 and short shovel turnings $30.

As most consumers are strikebound, however, little tonnage is moving at these lower prices. Meanwhile, allocations of industrial and railroad scrap have all but disappeared, although consumers have requested Washington to sustain allocation machinery for possible use later in the year once the steel strike is ended and scrap supply again tightens.

Pittsburgh—There is some weakening in the scrap market since there isn't any place for the scrap to move to, but so far there are no reports of distress offerings. Tending to depress the market are substantial scrap inventories at mills and plenty of tonnage in dealers' yards. The situation isn't all one sided, for rapid reduction in industrial scrap generation as plants run out of steel will slow down accumulations during the rest of the strike period. With ore movement from the lakes curtailed, greater pressure for scrap is seen following ending of the walkout. Belief currently is that prices may be shaded immediately upon resumption of steelmaking as dealers attempt to move material rapidly, followed by a stiffening to ceiling price levels. Cast grades are showing greater strength pricewise as some foundries increase use. One district mill reportedly purchased a sizeable tonnage of charg-

SIMONDS ABRASIVE CO.

Grinding Wheels

Simonds Abrasive Company grinding wheels make good news . . . a continued story in top economy, quality output and lasting performance.

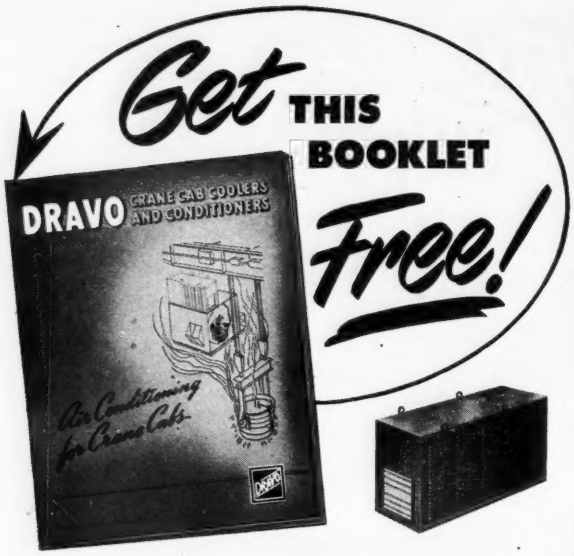
Behind this newsmaking efficiency is complete, exacting quality control from crude abrasive to finished wheels . . . plus accurate specifications that assure you of wheels that conform to *your* job needs.

Free data book gives information on our complete line, including grinding wheels, mounted wheels and points, segments and abrasive grain.

Let's send your copy, together with name of your Simonds distributor. Write.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.



If your industry has a problem of eliminating working hazards for crane cab operators such as extreme heat or dust and fume-laden air . . . or both . . .

. . . This new 24-page, illustrated booklet will show you how easily this can be corrected with Dravo Crane Cab Coolers and Conditioners. Booklet contents include:

- **Recommended cooling or conditioning equipment for any type crane.**
- **Installation information.**
- **Engineering specifications and data.**
- **Temperature conditions chart.**
- **Complete catalog of models and supplementary equipment.**

Dravo Crane Cab Coolers and Conditioners protect your crane cab operator, safeguard his health, increase his efficiency and alertness, and improve safety and production records in your operation. And ONLY DRAVO has a complete line of crane cab coolers and conditioners.

DRAVO
CORPORATION

PITTSBURGH • ATLANTA • BOSTON • CHICAGO • CINCINNATI
CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • ST. LOUIS
WASHINGTON

MAIL THIS COUPON FOR YOUR FREE BOOKLET
Dravo Corporation
606 Dravo Building
Fifth and Liberty Avenues
Pittsburgh 22, Penna.

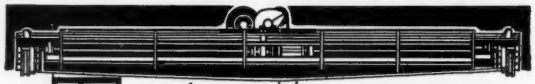
Please send me a free copy of "Dravo Crane Cab Coolers and Conditioners."

Name_____
Company_____
Address_____
City_____ Zone____ State_____

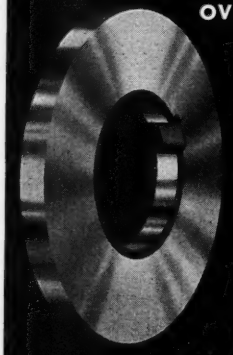
PERFORATED METALS
TO YOUR REQUIREMENTS
FOR
ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

H&G Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.
THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*


To Lower your Overhead..
BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
Office: 2409 E. York St.
Plant: Letterly & Gaul Sts.
Phone: Re-9-8911 **Phila 25, Pa.**

COWLES
GANG SLITTING KNIVES
OVER 30 YEARS EXPERIENCE

Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*
COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

ing box cast at the ceiling price of $47.

Cleveland — Decidedly easier tone prevails in the scrap market here but in the absence of mill sales it is impossible to determine the exact level of prices. Easiness extends through the list with dealers talking in terms of $3 to $4 per ton under ceiling prices. Tonnage is accumulating in yards and with only comparatively small lots moving to those mills still operating the pressure on the market is mounting. Mill stocks are estimated at better than 60 days. Indicative of improved supply conditions is a report circulating here to the effect government allocations will be discontinued beginning July 1. Expectations are easiness will persist in the scrap market for from 30 to 60 days following ending of the strike. This period of easiness, in the opinion of some trade interests, will be followed by a decided revival in strength on a fall surge of consumer buying.

St. Louis—Rerolling rails have virtually vanished from the scrap market as railroads hold up maintenance work pending post-strike delivery of new rails. Dealers predict they will stay scarce the rest of the year, since the tracklaying season will end before their deliveries resume, probably on a quota basis. Not a rail was included in a Frisco scrap list offered last week. In other grades, too, the market is at a standstill, with exception of Laclede Steel, which bought a quantity of unstripped motor blocks at $35 delivered, compared with the $43 shipping point ceiling.

Los Angeles—Dealers are continuing to purchase steelmaking scrap, and their inventories are rising. A few orders for No. 2 bundles are being filled at $5 below ceiling.

San Francisco—Scrap consumption has held up to some extent with two mills operating, and dealers' stocks have not built up too noticeably. Dealers, however, have not exerted much effort seeking scrap, but they have been taking that which is delivered to their yards. They prefer not to tie up their money, not knowing what the market will be when consumption returns to normal. Roughly, the operating rate of steel mills in the western area has held at 40 per cent with a number of "independent" mills working. This is considerably above the national average. Turnings joined No. 2 bundles in being quoted $5 under ceiling prices, but the purchasing prices of other grades posted by what steel companies are operating, remained unchanged at ceiling levels. Cast iron grades are in slow market. Cupola No. 1 is quoted at $42 a ton.

Warehouse . . .

Warehouse Prices, Page 125

Boston—Three district mill-connected warehouses were directed to ship orders on hand only at time of strike bearing symbols A, B, C, E, Z-2 and suffix B-5, but not D. Not much tonnage is involved due to imbalance in products required.

New York—Warehouses are taking in some steel from converters, cold-finished bars, wire and strip mostly. Incoming volume will be lowered as converters work off reserves of hot-rolled. Demand on distributors has increased, but there is little speculative buying.

Philadelphia—Warehouse trading is definitely off. Distributors ascribe the decline principally to shrinking inventories. Some warehouses are virtually cleaned out of the more popular sizes of bars and shapes and heavy gage plates. Monthly adjustment finds most quotations higher as a reflection of increased freight rates a few weeks ago.

Pittsburgh—Warehouse steel supplies are virtually nonexistant in standard items and only a few specialties are in fair shape. Three of the biggest warehouses in the district are still shut down by the strike. They are getting ready to reopen to ship material to the most essential classifications designated by the government. Not much material is available to meet specifications for direct defense and so the amount of relief provided by the partial reopening will be slight.

Cleveland—While warehouse stocks are shrinking steadily the distributors are not under the pressure for tonnage that ordinarily would be expected in view of the suspension of mill shipments in the strike. This complacency on the part of buyers in part is explained by the fact many manufacturing plants are closing down the first couple weeks of July for mass vacations. While inventories are low many shops appear to be banking on resumption of steel production by the time their vacations end. Also, the fact that warehouse purchases simply supplement mill shipments in many instances is a factor. Expectations are supply will be tight over the remainder of the year, especially in bars, heavy plates, and structurals. Even sheets will be scarcer than has been the case the past few months. Currently, some manufacturers are reported offering for sale surplus stocks of various steel products which they ordinarily do not use in their operations but had purchased during the period of acute shortage.

Chicago—Two more weeks will make warehouse steel stocks look very sick. Already the product mix is shot full of holes. Plates are virtually sold out and structurals and angles are approaching the same status.

St. Louis—Warehouse steel stocks are thinning fast under the strike stoppage of shipments. Scare-buying, however, is conspicuously absent, with pressure limited to those seeking components which are holding up assemblies. Warehouse inventories average three to four weeks but are badly broken sizewise.

San Francisco — Generally, there has been no rush to place orders with the distributors as a result of the shutoff of steel production. This indicated steel users were pretty well stocked up on run-of-the-mill items.

Seattle — Demand for warehouse items is fairly active but volume is far under what it would be if inventories were normal. Stocks of sheets and plates are reported ex-

PRECISION PRODUCTION *of* HARDENED AND GROUND SCREW MACHINE PRODUCTS

Representative Products

SPLINE SHAFTS—VALVE PLUNGERS—PUMP SHAFTS—ENERGY CELLS (Lanova Type)—CONTROL VALVES — ROTOR SHAFTS—ROTOR LINERS — OUTER RACES — VALVE TAPPET ROLLERS

OTTAWA STEEL PRODUCTS, INC.
GRAND HAVEN, MICHIGAN

hausted in this area and reinforcing bars are in extremely short supply. Even with an early resumption of mill operations, it will be at least four weeks before shipments from the East reach the Pacific.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3650 tons, superstructure, contract C-2a, Fitzgerald Expressway, Boston, to Bethlehem Steel Co.

2300 tons, transmission towers for Bonneville Power Administration, Portland, Oreg., to Creamer & Dunlap, Tulsa, Okla.

2000 tons, heat-treating building, Army Ordnance plant, Birdsboro, Pa., through Valley Forge Associates, Birdsboro, Pa., to the Belmont Iron Works, Eddystone, Pa.

850 tons, power plant extension, Gulf States Utilities, Scott, La., to Orleans Materials & Equipment Co., New Orleans; Stone & Webster Engineering Corp., Boston, contractor-engineer.

415 tons, state bridge, Luzerne county, Pa., to Anthracite Bridge Co., Scranton, Pa.

300 tons, two closure gates, Chief Joseph dam, Washington state, to Pacific Car & Foundry Co., Seattle.

240 tons, state bridge, Salem county, New Jersey, to Phoenix Bridge Co., Phoenixville, Pa.

100 tons, railroad bridge floor, Jersey City, N. J., to Oltmer Iron Works, that city.

100 tons, also reinforcing, shop building for Alaska Railroad, Anchorage; general contract to Warrack Construction Co., Seattle; steel furnished by Alaska Railroad.

STRUCTURAL STEEL PENDING

655 tons, viaduct, J. J. Storrow Memorial Drive, Charles River reservation, Boston; C. J. Maney Co, Inc., Somerville, Mass., low, general contract; also 75 tons reinforcing steel.

200 tons, also 35 tons reinforcing, 450-foot state highway bridge, Toole county, Montana; bids to Helena, June 26.

REINFORCING BARS . . .

REINFORCING BARS PENDING

350 tons, bridge, project 185, Baltimore-Washington parkway, Prince Georges county, Maryland; bids July 2, Bureau of Public Roads, Arlington, Va.

165 tons, Washington state highway girder bridge, Clark county; general contract to D. M. Drake Co., Portland, Oreg.

155 tons, five state bridges, Essex-Gloucester-Manchester, Mass.; Gil Wyner Co. Inc., Malden, Mass., general contractor.

PLATES . . .

PLATES PLACED

2850 tons, gas holder, Philadelphia Gas Works Co., Philadelphia, to Koppers Co., Baltimore.

1200 tons, liner plates, Palisades dam project, Idaho, to American Pipe & Construction Co., Portland, Oreg.

855 tons, hull plates, Navy Purchasing Office, Washington, to Hanlon-Gregory Galvanizing Co., Pittsburgh; also 240 tons, medium steel angles, to same galvanizing shop.

280 tons, five fuel storage tanks, Atlantic Refining Co., Philadelphia, to the Chicago Bridge & Iron Works, Chicago.

PLATES PENDING

200 tons or more, bulk aircraft fuel tanks, McChord Field, Washington state; Consolidated Western Steel Corp., Seattle, low at $112,255.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Bessemer & Lake Erie, 25 diesel-electric locomotive units; eighteen 1500-hp road units and three 1500-hp road switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; two 1600-hp switching units to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; two 1000-hp switching units to American Locomotive-General Electric Companies, Schenectady, N. Y.

Central of Georgia, fifteen 1600-hp road switching diesel-electric units, to American Locomotive - General Electric Companies, Schenectady, N. Y.

Chesapeake & Ohio, 43 diesel-electric locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; list comprises four 4500-hp freight locomotives each consisting of three 1500-hp units; twenty-nine 1500-hp road switchers; and two 1200-hp yard switchers.

Chicago, Burlington & Quincy, 31 diesel-electric locomotice units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; list includes seventeen 1500-hp and four 3000-hp road switching locomotives; six 2250-hp passenger locomotives.

Great Northern, one 3000-hp diesel-electric locomotive, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

New York, Chicago & St. Louis, 25 diesel-electric locomotive units; ten 1500-hp road switchers going to Electro Motive Division, General Motors Corp., La Grange, Ill.; ten 1000-hp yard switchers to American Locomotive-General Electric Companies, Schenectady, N. Y.; five 1200-hp yard switchers, to Fairbanks, Morse & Co., Chicago.

St. Louis Southwestern, 12 diesel-electric locomotive units; eight 1600-hp road switching units to American Locomotive-General Electric Companies, Schenectady, N. Y., and four 1500-hp freight units to Electro-Motive Division, General Motors Corp., La Grange, Ill.

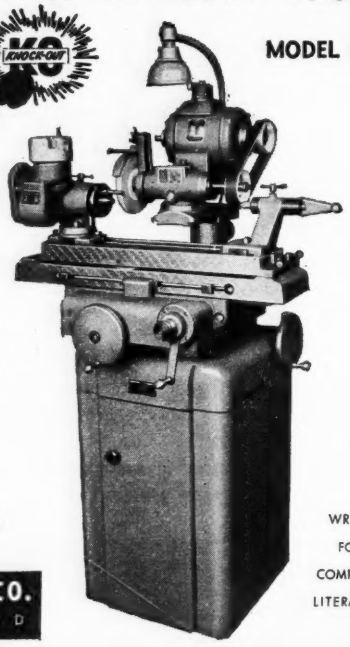
Seaboard Airline, 60 diesel-electric locomotive units; five 2250-hp passenger units and twenty-five 1590-hp freight-service road-switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; ten 1600-hp road-switching units and ten 1000-hp yard-switching units, to American Locomotive-General Electric Companies, Schenectady, N. Y.; ten 1200-hp switching units to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

New York, New Haven & Hartford, six stainless steel self-propelled diesel rail passenger cars to the Budd Co., Philadelphia.

There's a reason 71%
of all popularly-priced Tool and Cutter Grinders sold in 1951 were "Knock-Outs"

MODEL B860



Will do anything that machines costing 2 or 3 times more will do . . . yes and in less time.

Distributed Only Through Franchise Dealers

K. O. LEE CO.
ABERDEEN, S. D.

WRITE FOR COMPLETE LITERATURE

Each link of pickling chain carries its own HEAVY BURDEN

SAFETY
PRODUCTION
PROFIT

so you owe it to yourself, your employees and your customers to use only the SAFEST CHAIN POSSIBLE in your pickling department. We make BRONZE DIE-CAST CHAINS of "ALBRO" METAL. Our links are acid-resisting and exceptionally strong. Because the links are not eaten by the acid, "ALBRO" METAL chains remain in constant use for seven and eight years.

WE REPAIR ALL TYPES OF CHAINS

No matter what kind of a chain you're now using, we are well equipped to repair it for you. We can cast the new link in your chain in a hurry. When the chain is put in use again, you can see for yourself the superior qualities of "ALBRO" METAL.

BRONZE DIE CASTING CO.
FRANKLIN ST. AT OHIO RIVER, PITTSBURGH, PA.
"ALBRO" METAL

Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Malleable Founders Honor Ralph Cole

1951 McCrea Medal, awarded annually for outstanding service to the malleable castings industry, was presented to Ralph N. Cole, president, Canton Malleable Iron Co., Canton, O. The presentation was made by Wilson H. Moriarty, vice president, National Malleable & Steel Castings Co., Cleveland, at Malleable Founders Society's annual banquet held at The Homestead, Hot Springs, Va.

Equitable Enters Equipment Field

Equitable Powder Mfg. Co., an affiliate of Olin Industries Inc., East Alton, Ill., entered the compressed air mining equipment field through acquisition of an interest in Armstrong Coalbreak Co., Benton Harbor, Mich. Armstrong holds basic patents and sells and services equipment for the rapidly growing compressed air coal mining technique.

Applied Research To Buy Equipment

Applied Research Laboratories, Glendale, Calif., manufacturer of spectrochemical instruments for testing organic and inorganic material, completed public sale of 33,000 shares of stock to purchase additional equipment and to provide working capital.

Bethlehem Steel Plans Expansion

Bethlehem Steel Co., Shipbuilding Division, Baltimore, is seeking to buy from the city 3.1 acres of vacant land at the foot of Hughes street and Key highway for expansion of its plant facilities. The Port Development Commission approved the measure and the City Planning Commission now has it under advisement.

Midwest Piping Enlarges Plant

Midwest Piping & Supply Co. Inc., St. Louis, completed a large addition to its welding fittings manufacturing plant, adding 48,000 square feet of floor space and more than doubling the pressing and welding capacity. With equipment, the project represents an investment of about $500,000.

Metal Carbides Plans $1 Million Plant

Metal Carbides Corp., Youngstown, will start construction soon of a $1 million plant in Boardman, O., a suburb of Youngstown. The new facility will have a monthly capacity of about 25,000 pounds of tungsten carbide metal, tungsten alloy heavy-metal, titanium metal and other special alloys made from powdered metals. The company's main plant at 107 E. Indianola Ave. will continue to produce tungsten carbide cutting tools, drawing dies, rolling mill rolls, diamond products and machine tool attachments. The productive capacities of the main plant were more than doubled during the last two years.

Franklin Increasing Motor Output

A new plant, completed in June by Franklin Electric Co. Inc., at 458 E. Spring St., Bluffton, Ind., adds 48,000 square feet of production area. The plant is designed for economies in producing fractional horsepower electric motors. E. J. Schaefer is president.

Junior Steel Expands Warehouse

Junior Steel Co. is expanding its steel fabricating warehouse and handling equipment at 190 S. Alameda, Los Angeles.

Southwest Products Building Plant

Southwest Products Co., Pasadena, Calif., is constructing a plant in Monrovia for manufacture of push-pull controls and self-aligning bearings. Completion is scheduled by August.

Union Steel Enlarges Facilities

Union Steel Co., Aircraft and Guided Missile Division, Los Angeles, added 20,000 square feet of production facilities. The firm manufactures precision jigs and fixture tooling for aircraft.

Vinco Buys Industrial Stamping

Vinco Corp., Detroit, manufacturer of tools, gages and precision assemblies, acquired Industrial Stamping & Mfg. Co., that city. Charles H. Mayne, president of Industrial Stamping, becomes vice president in charge of sales for Vinco.

Collins To Make Electronic Items

Collins Mfg. Co. Inc., Baltimore, equipped several thousand square feet of space at 702 N. Kresson St., for manufacture of electronic items. Laurence H. Collins is president.

Kingsbury Machine Tool Names Agent

Kingsbury Machine Tool Corp., Keene, N. H., appointed Four States Machinery Co. as its exclusive distributor in the Chicago and Milwaukee areas.

Speer Carbon Co. Reorganizes

Speer Carbon Co., Saint Marys, Pa., and its subsidiaries: Jeffers Electronics Inc., Dubois, Pa., International Graphite & Electrode Corp., Niag-

WASHERS

—special sizes
—special shapes
—flat
—concentric
—standard sizes

We fabricate from:

lead
lead alloys
clad bi-metals
brass
bronze
copper
aluminum
block tin
fusible metals
solder
brazing alloys
bearing bronze
clock brass
fibers
plastics
special materials

Send your specification charts. Deliveries are prompt; prices right.

LEAD ALLOY PRODUCTS CO.

9108 ROSELAWN AVENUE
DETROIT 4, MICHIGAN

Certified Steel Abrasives

SAMSON SHOT

Reg. U. S. Pat. Off.

FOR USE IN BLAST CLEANING EQUIPMENT

SAMSON SHOT
ANGULAR GRIT

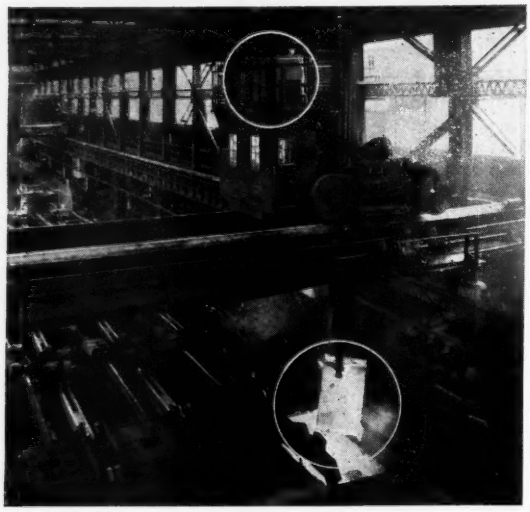
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASSACHUSETTS

CHEMSTEEL CONSTRUCTION COMPANY, INC.
203 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.

(No "tie-in" with any manufacturer)
Send data on your Design, Engineering & Construction Facilities for erection of
ACID-ALKALI-PROOF TANKS & FLOORING

NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE..STATE....

J&L STEEL uses... DRAVO CRANE CAB COOLERS in its "HOTTEST SPOT"



SOAKING PIT OPERATIONS MADE MORE EFFICIENT, WORKING CONDITIONS BETTER

The hottest spot in any steel mill crane operation is over the soaking pit. Temperatures range as high as 170° F.; dirt, dust, fumes and gases limit the time any man can work his crane over this installation.

Jones & Laughlin Steel Corporation has eliminated this working hazard by installing Dravo Crane Cab Coolers on the cranes working over these hot spots.

CRANE CAB COOLERS HAVE LONG SERVICE LIFE, PROVIDE YEAR-'ROUND AIR CONDITIONING

Dravo Crane Cab Coolers are ruggedly constructed, factory assembled and pre-tested to provide years of more-than-satisfactory service. All equipment in the unit is readily accessible with ample space for quick and efficient maintenance.

In the various air conditioning functions the crane cab cooler not only filters the air, removes dust, dirt and fumes, but heats the cab in winter, cools it in summer and provides constant ventilation the year around.

AVAILABLE IN SINGLE UNIT OR IN SPLIT-TYPE UNIT; IMMEDIATE DELIVERY

Dravo Crane Cab Coolers are built in two models—the self-contained unit, mounted on any available space on the crane and the new split-type unit where the condenser section is mounted on the crane, with the conditioning section in cab.

The Dravo Crane Cab Cooler can be easily and quickly installed on any type of crane with a minimum of down-time required. Units are available now! Write for more information —or phone the nearest Dravo Office and have our representative call on you.

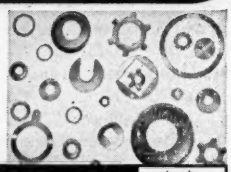
DRAVO **DRAVO CORPORATION**

606 DRAVO BUILDING, PITTSBURGH 22, PA.

PITTSBURGH • PHILADELPHIA • CLEVELAND • NEW YORK • CHICAGO
DETROIT • ATLANTA • BOSTON

"WHITEHEAD WILL HAVE DIES FOR THESE WASHERS"

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. WRITE FOR CATALOG.



WHITEHEAD STAMPING CO.

WHITEHEAD EST. 1903

1667 W. Lafayette • Detroit 16, Mich.

STEEL CASTINGS UP TO 8000 LBS.

SQUEEZER • ROLLOVER • LOOSE PATTERNS
OPEN CAPACITY. SEND INQUIRIES
Telephone TRinity 2-6000

RAY A. SCHARER & CO.
3000 E. Grand Blvd., Detroit 2, Michigan

THE BELMONT IRON WORKS

AISC

STRUCTURAL STEEL—BUILDINGS & BRIDGES

RIVETED—ARC WELDED *Cable Address—Beliron*

Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

The *Cleveland Steel Tool Co.*

• PUNCHES • DIES • CHISELS • RIVET SETS •

IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE

WE FEATURE SPECIAL PUNCHES & DIES
660 E. 82nd ST., CLEVELAND, O.

OHIO LOCOMOTIVE CRANES

25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages 4 tables
69 illustrations Price $5.00 Postpaid

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

Automaticity Comes to the Freight Yard

Cars loaded with automobile frames take an automatically-controlled route in Milwaukee's Air Line Yard of the Chicago, Milwaukee, St. Paul & Pacific Railroad. Pushbuttons in the control tower activate the switching controls and speed retarders seen in the foreground. Gravity does the rest. The system is the product of the Union Switch & Signal Division of Westinghouse Air Brake Co.

ara Falls, N. Y., and Speer Resistor Corp., Saint Marys, consolidated into one company, Speer Carbon Co. The various subsidiaries are now operating as divisions of Speer Carbon Co.

Lockheed Erects $5 Million Building

Lockheed Aircraft Corp., Burbank, Calif., is constructing a $5 million flight line hangar and electronics building in Marietta, Ga., as part of a $10 million air facility expansion.

Binks Mfg. Moves Cleveland Office

Binks Mfg. Co., Chicago, moved its Cleveland office and warehouse to larger quarters at 1241 W. Ninth St. B. R. Fulton is district manager while H. G. Pankratz is district engineer for this manufacturer of spray finishing systems.

Standard Buys Castings Firm

Centrifugal Investment Casting Co., Los Angeles, was purchased by Standard Thompson Corp., Dayton, O. Centrifugal manufactures metal castings at 24 S. Front St., Burbank.

Stratos Opens Bayshore Plant

Stratos Division, Fairchild Engine & Airplane Corp., New York, placed its new Bayshore, L. I., plant into operation. The plant contains over 140,000 square feet of floor space and has facilities which will permit increased output of aircraft pressurization and refrigeration equipment and other aircraft accessories. The division previously was at Farmingdale, L. I.

Electro Manganese Names Exporter

Electro Manganese Corp., Knoxville, Tenn., appointed Leonard J. Buck Inc., Jersey City, N. J., as exclusive export agent for all foreign countries, except Canada, for its electrolytic manganese.

Davison Chemical Builds Warehouse

Davison Chemical Corp., Baltimore, is erecting a 37,200-square-foot warehouse building. Chester F. Hockley is president.

Allied Chemical Forms New Division

Allied Chemical & Dye Corp., New York, formed a Nitrogen Division to take over the manufacturing and related operations of the nitrogen and organic sections of the Solvay Process Division and the sale of products involved.

Nabakowski To Operate in Texas

A. Nabakowski Co., Amherst, O., was granted a charter to engage in the iron and steel business in Texas. Texas agent for the company is R. O. McGraw, 501 Riverside Dr., Ft. Worth.

Jacobs Redesigns Helicopter

Jacobs Aircraft Engine Co., Pottstown, Pa., subsidiary of Barium Steel Corp., New York, plans to produce a 5-place helicopter of radically new design and performance.

Diamond Transfers Export Activities

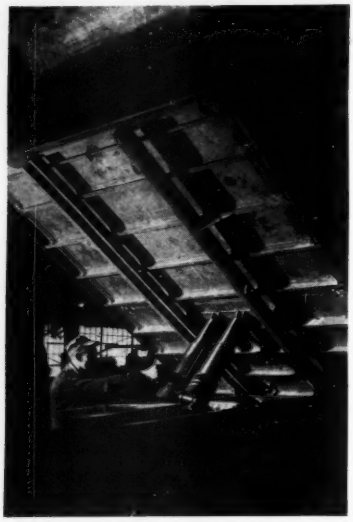
Export sales activities of Diamond Alkali Co.'s subsidiary, Kolker Chemical Works Inc., were transferred to Diamond's Export Sales Division, New York. Kolker specializes in organic chemicals for agriculture and industry.

Twin Coach Leases Buffalo Plant

Aircraft Division, Twin Coach Co., Kent, O., leased 15,000 square feet of manufacturing space at 128 Perry St., Buffalo. Production at the new location will start about July 21 with

MATHEWS
CONVEYERS
Since 1905. Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-working Industries.
Three modern plants. Engineering Offices in All Principle Cities. There's an Engineering Sales Office near you.
MATHEWS CONVEYER CO.
ELLWOOD CITY · PENNSYLVANIA
SAN CARLOS · · CALIFORNIA
PORT HOPE · ONTARIO, CANADA

DESTACO
DETROIT STAMPING COMPANY
PRECISION • VOLUME • SPEED • ECONOMY
Small and Intricate to Medium Heavy Stampings
Detroit Stamping Company • 359 Midland Ave. • Detroit 3, Mich.



Built for the Job

This is one of a fleet of 15 trucks used by the E. F. Robinson Co., Pittsburgh, for excavating and filling work on the Penn-Lincoln Parkway in Pittsburgh. The body and supporting members are made of Otiscoloy, a Jones & Laughlin Steel Corp. product. The bed is made of Jalloy, a J&L alloy

some small assembly operations being shifted from the main plant on Cayuga road.

Johns-Manville Expands Watson Plant

Johns-Manville Corp., New York, is expanding its plant at Watson, Calif., for production of industrial insulations. Construction of the building, to enclose about 100,000 square feet, is scheduled to be completed in the early fall of next year.

Work To Proceed on New Can Plant

American Can Co., New York, received government approval for use of structural materials required to erect a can manufacturing plant near Harrisburg, Pa. Completion of the project and installation of machinery are expected by the summer of 1953. Rated capacity of the plant will be in excess of 400 million food cans a year.

Westinghouse To Build in Vicksburg

A multimillion dollar plant for the manufacture of industrial and commercial lighting equipment will be erected by Westinghouse Electric Corp. on a 55-acre site adjacent to the Vicksburg, Miss., airport six miles south of the city. This is part of the firm's $296 million expansion program. As Westinghouse gradually moves industrial and commercial fluorescent and industrial incandescent production to the new plant, the firm will use the space freed at Cleveland to expand production of street lighting units, aviation lights, floodlights and will boost output of such military items as searchlights. If construction can get under way by August, the plant should be ready for occupancy by early fall of 1953.

Canadian Pacific Plans Service Shop

Canadian Pacific Railway, Montreal, will build a diesel service shop in Nelson, B. C., at a cost of about $1 million.

RCA Awards Canadian Plant Contract

Contract for construction of a $1 million electronics plant in Prescott, Ont., for RCA Victor Ltd., Montreal, was awarded to Concrete Construction Co. Ltd., that city. The plant is to be ready for operation within about a year.

CASH
FOR USED TRANSFORMERS

We need your used transformers.
Send us a description of those you'd like to dispose of TODAY.

TRANSFORMERS BOUGHT, SOLD and REPAIRED

THE ELECTRIC SERVICE CO.
5313 Hetzel St., Cincinnati 27, Ohio

Wanted
A PYRAMID ROLL
Motor driven ¾" plate capacity 30' minimum length of plate and 36" I.D. Must be drop end for rolling heavy pipe sections.
Write Box 533, STEEL,
Penton Bldg., Cleveland 13, Ohio.

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ¾" Pl.
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

BORING MILLS, 48" and 72" Gisholt.
BULLDOZERS, No. 25 and 27, W. & W.
HAMMER, NAZEL, 5-N, 6" x 6", M.D.
KEYSEATERS, Nos. 1, 2 and 5, BAKER.
LATHE, 42" x 30' PUTNAM, M.D.
PRESS, TRIMMING, No. 6 W & W, 225 ton.
SHEAR, 140" x ⅜" E. W. BLISS.
WEST PENN MACHINERY COMPANY
1210 House Bldg. Pittsburgh 22, Pa.

CIMCO SELECT MACHINE TOOLS GUARANTEED

Defiance #3, Upright Drill, #5MT.
Niles 36-44 Vertical Boring Mill.
Colburn 54" Vert. Boring Mill, 2 heads.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, late type.
LeBlond #2½ Univ. Miller, 3 SCD.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Landis 10x18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis #2 Universal Grinder, cone drive.
Cincinnati 16 x 96 Plain Cylindrical Grinder.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2½" hole in spindle, 54" centers.
Lodge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 18', 4 SCD, 12' center distance, Loose change.
American 36" x 33' center distance, 2⅝" hole in spindle, first class.
American 48" x 10' centers, 2⅝" hole in spindle, first class.
LeBlond 21" x 10' bed, 3 SCD, 5'2" centers.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Milwaukee 1½B Plain Miller, single pulley drive, double overarm.
Liberty 36" x 36" x 18' Double Housing Planer, 2 rail and 2 side heads.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Cincinnati #2 Vertical Mill, single pulley drive.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Niles 84" x 84" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.

GUARANTEED MACHINERY
Cincinnati Machinery Company Incorporated
207 E SECOND STREET
CINCINNATI 2, OHIO

FORGING & DIE SINKING EQUIPMENT
All Kinds We Buy—We Sell Contact Us First
WILKIE DIE PRODUCTS COMPANY
Specialists In Forging Equipment
1186 Hawthorne Blvd. Grosse Pointe Woods 30, Mich.
Phone (Detroit) TUxedo 1-7140

WIDE STEEL SHEETS
Seam Weld your narrow sheets with our high speed Sciaky 500 KVA Three Phase Seam Welder, having 38" throat. Immediate delivery from stock.
MONTGOMERY ENGINEERING CO.
14164 Prairie Ave. Detroit 4, Mich. TExas 4-2040

RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton
Cabooses, Eight Wheel, Cupola Type
Flats, 40-and 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite or All Steel, 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE AIR DUMP CARS

Four—30-Yd., 50-Ton Cap., All Steel, Side Dump (Drop Door)
End Dump, 20-Yd., 50-Ton Drop Door End Dump, 10-Yd., 30-Ton Lift Door
Side Dump, 16-Yd., 30-Ton Lift Door

STANDARD GAUGE DIESEL LOCOMOTIVES

One Plymouth Diesel-Mechanical, 65-Ton, Type 0-6-0, Built 1940
One 1500 H.P., 120-Ton, Road Switcher, Diesel-Electric, Type 0-4-4-0

Send us your inquiries **WE BUY FREIGHT CARS FOR DISMANTLING** *Send us your offerings*

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED

Accounts Wanted

SALES REPRESENTATIVE
Man with over 30 years' sales experience serving metalworking field has decided to operate as a Manufacturers' Agent covering Northern Ohio for one or two well-established lines. Interested in lines sold to metalworking including castings, forgings, gears, fasteners and sintered powdered metal parts. Address Box 532, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

BLOOMING OR SLAB MILL SUPERINTENDENT,
Roller, or Instructor. 16 years diversified mill experience, 10 years as top roller. Can furnish excellent references. Will go anywhere. Write Box 531, STEEL, Penton Bldg., Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $3,500 TO $35,000. WE offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

Help Wanted

WANTED—ASSISTANT PLANT ENGINEER
Familiar with maintaining mechanical and electrical equipment. Write Box 521, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL SALESMEN WANTED
We need established commission salesmen to represent us in New York, New England, Canada, Detroit, Indianapolis, Cincinnati, St. Louis, Milwaukee and Cleveland. Write Box 528, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL WAREHOUSE MANAGER

Progressive established company wants experienced steel warehouse man to take complete charge of sales and operations of steel warehouse servicing Chicago area with steel mill products. Must be experienced with good record. Earnings based on ability and accomplishment. Submit detailed resume of experience. All replies strictly confidential. Our personnel know of this advertisement. Box No. 534, STEEL, Penton Bldg., Cleveland 13, Ohio.

MICHIGAN SALES OUTLET

Sales Engineering Company has facilities for representation of one more quality account, requiring both sales and field engineering efforts. We are comprehensively acquainted with Purchasing, Plant Engineering, and Master Mechanic's Divisions of Automotive and Chemical Industries.

Write Box 527, STEEL,
Penton Building Cleveland 13, Ohio

MANUFACTURERS AGENT

calling on Metal Fabricators, Machine-Shops, Foundries and Manufacturers of Industrial Equipment, in Minnesota, North & South Dakota, & NW Wisconsin.

DESIRES ADDITIONAL LINES
Write Chas. D. Gallaher,
11150 S. Old Shakopee Rd.,
Minneapolis 20, Minn.

Wanted
General Purchasing Agent

for central purchasing office of firm having multiplant ferroalloy manufacturing operations.

Must have detailed knowledge of chrome ore procurement and be familiar with import procedures as well as having experience in purchase of substantial tonnages of domestic commodities, such as coal, coke and steel scrap.

Reply to:
Mr. Charles F. Colbert, Jr., President
Pittsburgh Metallurgical Co., Inc.
P. O. Box 636, Niagara Falls, New York

DIRECT to DRAKE
ALL YOUR
EMPLOYMENT PROBLEMS
International Coverage
GUARANTEES
CLIENT and CANDIDATE
MAXIMUM SELECTION

A brief letter telling us your needs or experience, will receive our prompt and confidential attention.

ERIC MOORE, Manager
DRAKE PERSONNEL
Suite 1009 **7 W. Madison St.**
Chicago 2, Ill. **Financial 6-2100**

FOR SALE
EL. WELD, HRP STEEL TUBING
15,000 ft. 1"-16 ga. x 10 ft. @ 8.50 C ft.
15,000 ft. 1¼ 16 ga. x 12 ft. @ 9.25 C ft.
2400 ft. 1¾ 14 ga. x 4 ft. @ 14.00 C ft.
LOCK SEAM STEEL TUBING
60,000 ft. ¾ x .020 x 15 ft. Galv. @ 6.00 C ft.
16,000 ft. 1¼ x .020 x 2 ft. @ 5.00 C ft.
TOP IND. SALES
130 West 18th Street, New York City

FOR SALE
FILTER FOR OIL CLARIFICATION
22—Sperry 18" x 18" Filter Presses, plate & frame, closed delivery, 11 chambers, ½".
1—Tolhurst 48" center slung Chip Wringer, 7½ HP Motor.
CONSOLIDATED PRODUCTS CO., INC.
15-21 Park Row New York 38, N. Y.
BArclay 7-0600

FOR SALE
4—8" x 12" United 2-High Cold Mills with Combination Pinion Stands and Gear Sets; D. C. Motor Drives; Coilers.
FRANK B. FOSTER, INC.
2220 Oliver Building Pittsburgh 22, Pa.
Cable Address "Foster Pittsburgh"

WORLD'S LARGEST INVENTORY
FREE CATALOG
MOTORS—GENERATORS—TRANSFORMERS
New and Guaranteed Rebuilt
1 H.P. to 2500 H.P.
ELECTRIC EQUIPMENT CO.
P. O. BOX 51, ROCHESTER 1, N.Y.

REFRIGERATION UNITS
TWO PRACTICALLY NEW
WORTHINGTON CARBONDALE
REFRIGERATION COMPRESSORS
300 Ton Freon
Ideal for large plant or office building
WILL SACRIFICE
WINSTON MACHINERY CO., INC.
326 WEST OHIO STREET
INDIANAPOLIS, INDIANA

UPSON-WALTON drop-forged clips

ENGINEERED FOR SAFETY

Heavy, steel U-bolt; hot galvanized after threading to prevent weakening from rust or corrosion.

Clip bases drop-forged under close supervision in accurately made dies. Bases made of high grade forging steel and hot galvanized.

American Standard heavy hex nut... hot galvanized for long life.

Upson-Walton drop-forged steel clips are made to the highest standards of quality for tough, heavy-duty service. *See your distributor* for quick and efficient service from stock. Write for free catalog on wire rope fittings.

THE UPSON-WALTON CO.

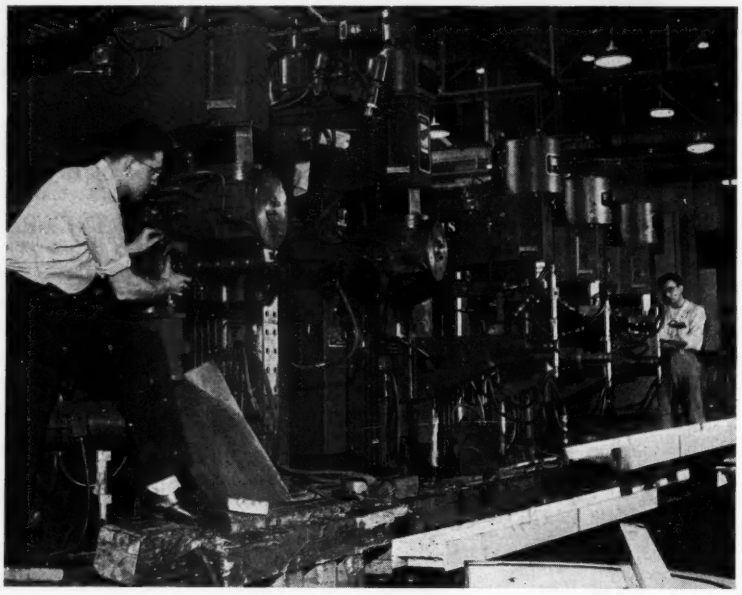
12500 ELMWOOD AVENUE • CLEVELAND 11, OHIO

New York • Chicago • Pittsburgh

YOU CAN DEPEND ON UPSON-WALTON'S 81 YEARS OF EXPERIENCE

Manufacturers of ALL THREE

WIRE ROPE • ROPE FITTINGS • TACKLE BLOCKS



New Welding Machines for P&WA

At Pratt & Whitney Aircraft Division of United Aircraft Corp., welding is one of the most important processes in jet engine manufacture. Two inspectors check several new welding machines received at the East Hartford, Conn., plant

Ohio State University Honors Bailey

E. G. Bailey, founder and president of Bailey Meter Co., Cleveland, and director and consultant of Babcock & Wilcox Co., New York, was presented with the Distinguished Service Award of Ohio State University for his contributions to the engineering profession and for his work in the engineering manpower field.

Harnischfeger Opens Illinois Plant

Harnischfeger Corp., Milwaukee, officially opened its new Diesel Engine Division in Crystal Lake, Ill., bringing to nine the number of plants in operation. Karl P. Schoeppner is general manager of the division.

Schroeder Moves Into New Factory

Fred Schroeder Mfg. Co., aircraft valve and components producer, moved into a new factory at 12021 Vose St., North Hollywood, Calif.

GE Expands Erie Foundry Facilities

A $1 million expansion of foundry facilities is underway at the Erie, Pa., Works of General Electric Co. Considerable amount of the company's foundry work is being moved to Erie.

Ostrom Buys C. Kirk Hillman Co.

Cyrus W. Ostrom and associates acquired the business of C. Kirk Hillman Co., industrial machinery firm operating in Seattle for the last 39 years. Mr. Ostrom, former general manager, is president succeeding Mr. Hillman, retired. George W. Palo and Malcolm E. Hillman continue as chief engineer and sales engineer, respectively.

Johns Hopkins To Expand Laboratory

Johns Hopkins University, Baltimore, received approval from National Production Authority for a $1.8 million expansion for research work on guided missiles at the laboratory it operates at Silver Spring, Md. This work is in co-operation with the Navy Bureau of Ordnance.

Hardinge To Build Plant Addition

Hardinge Bros., Elmira, N. Y., will erect a plant addition which will be used for the manufacture of machine tools. The addition will cost nearly $70,000 and the firm has received a quick tax write-off on the project.

Wilcox-Gay Appoints Distributor

Wilcox-Gay Corp., New York, appointed Bruno-New York Inc., that city, as exclusive metropolitan New York distributor for the company's line of Recordios, disks and recording accessories.

Quaker Increases Production

New $750,000 compounding and mixing building at Quaker Rubber Corp., division of H. K. Porter Co. Inc., Philadelphia, is now in operation. The new facilities are designed to provide overall increased production and top quality industrial rubber products.

Advertising Index

Abrasive Products, Inc. 115
Air Reduction 122
Allied Research Products, Inc. 104
American Chain & Cable, Page Steel & Wire Division 146
American MonoRail Co., The 108
American Roller Die Corporation 98
American Welding & Manufacturing Co., The. 74

Babcock & Wilcox Co., The, Tubular Products Division ..... Inside Front Cover
Bakelite Co., A Division of Union Carbide & Carbon Corporation 18
Barber-Colman Co. 112
Belmont Iron Works, The 140
Bethlehem Steel Co. 1
Bixby, R. W., Inc. 143
Boston Woven Hose & Rubber Co. 28
Bristol Brass Corporation, The 33
Bronze Die Casting Co. 138
Browning, Victor R., & Co., Inc. 136
Buffalo Bolt Co. 99
Bunting Brass & Bronze Co., The 128

Carpenter Steel Co., The 131
Cattie, Joseph P., & Brothers, Inc. 136
Central Steel & Wire Co. 13
Chandler Products Corp. 58
Chemsteel Construction Co., Inc. 139
Cincinnati Machinery Co., Inc. 142
Cities Service Oil Co. 97
Cleveland Steel Tool Co., The 140
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 124
Columbia Steel & Shafting Co. 16
Consolidated Products Co., Inc. 143
Cowles Tool Co. 136
Cuyahoga Spring Co., The 106

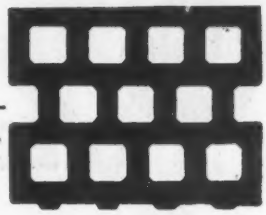
Detroit Stamping Co. 141
Diamond Mfg. Co. 136
Drake Personnel 143
Dravo Corporation 136, 140

Eastern Machine Screw Corp., The 136
Electric Controller & Mfg. Co., The 38
Electric Equipment Co. 143
Electric Service Co., The 142
Erie Foundry Co. 29
Ex-Cell-O Corporation 4, 5

Fairbanks, Morse & Co. 21
Farval Corporation, The ..... Inside Back Cover
Finkl, A., & Sons Co. 11
Foote Bros. Gear & Machine Corporation 25
Foster, Frank B., Inc. 143

Continued on following page

Perforated metal screens
for any requirement



WITH facilities for producing any shape and size of perforations in any commercially rolled metal, of whatever gauge desired, Hendrick can furnish the most suitable form for a specific screening application.

To best meet certain requirements, Hendrick developed the "squaround" perforation illustrated. Other standard forms include round, square, hexagonal, diamond and slot perforations in hundreds of sizes of openings. Write for full information.

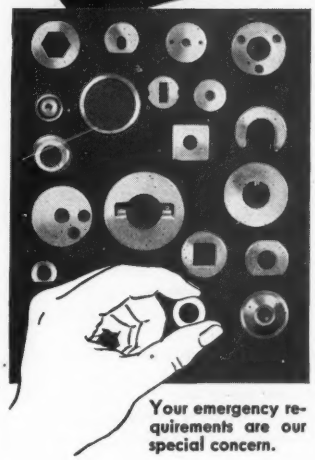
SEE OUR CATALOG IN SWEET'S

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

HENDRICK
Manufacturing Company
30 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Standard .. Specials

STEEL WASHERS
FOR EVERY NEED



A DEPENDABLE SUPPLIER FOR 38 YEARS . . .

Your requirements for standard and special steel washers are sure to be satisfied at Joliet. A bank containing thousands of special dies in many shapes and forms, 9/32" to 8" O.D., gauges No. 28 to 3/8", stands ready to answer your needs. A VARIETY OF FINISHES IS AVAILABLE to meet your special needs, including: Electro-plating, Galvanizing, Parkerizing, and Cyanide hardening.

After All!
THERE'S NO SUBSTITUTE FOR QUALITY AND SERVICE

Your emergency requirements are our special concern.

202 CONNELL AVE.
JOLIET, ILLINOIS

JOLIET WROUGHT WASHER CO.

Shaped Wire*

— Flat
● Round
⧗ Odd contour

Low or high carbon, stainless, special alloy, Armco. You draw the shape—PAGE can draw the wire.

Armature Banding Wire

Tinned stainless or carbon steel. In reels of 50 to 200 pounds. Stainless has high tensile strength, high resistance, low permeability.

Lock Safety Wire

Tough, durable, workable. In the size and type for your work.

Spring Wire

Any shape* . . . high carbon . . . hard drawn . . . high tensile . . . stainless . . . galvanized . . . tinned . . . bright.

*Cross-sectional areas up to .250" square; widths to ⅜"; width-to-thickness ratio not exceeding 6 to 1.

YOU do this—
Give us the specifications of the wire you need—or tell us details of job to be done.

WE'LL do this—
Send you recommendations, prices and delivery date. Samples on request. PAGE offers you a wide variety of wires to choose from.

Wire or Write Today

PAGE WIRE

ACCO

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

Advertising Index

Concluded from preceding page

Globe Brick Co., The 110
Gregory Industries, Inc., Nelson Stud Welding Division 10

Hanlon-Gregory Galvanizing Co. 102
Heald Machine Co., The 2
Hendrick Manufacturing Co. 145
Hyatt Bearings Division, General Motors Corporation 60

Inland Steel Co. 42
International Nickel Co., Inc., The 34
Iron & Steel Products, Inc. 143

Joliet Wrought Washer Co. 145
Jones & Lamson Machine Co. 23

Kaiser Aluminum & Chemical Sales, Inc., Chemical Division 88
Kewanee-Ross Corporation 85
Kling Bros. Engineering Works 41

Lake Erie Engineering Corp. 94, 95
Landis Machine Co. 15
Lead Alloy Products Co. 139
Lee, K. O., Co. 138
Link-Belt Co. 32
Logemann Brothers Co. 127
Luria Brothers & Co., Inc. 116

Mathews Conveyer Co. 141
Morgan Construction Co. 57
Morgan Engineering Co., The 91
Morris Machine Tool Co., The 37
Moto-Truc Co., The 111

National-Standard Co., Reynolds Wire Division 24
National Steel Corporation 101
Nelson Stud Welding Division of Gregory Industries, Inc. 10
New Departure, Division of General Motors Corporation 63
Niagara Blower Co. 12
Niagara Machine & Tool Works 26, 27
Nox-Rust Chemical Corporation 133

Ohio Locomotive Crane Co., The 140
Ohio Steel Foundry Co., The 68
Osborn Manufacturing Co., The 3
Ottawa Steel Products, Inc. 137

Page Steel & Wire Division, American Chain & Cable 146
Pelron Corporation 6
Peters-Dalton, Inc. 107
Pittsburgh Crushed Steel Co. 139
Pittsburgh Steel Co., Thomas Strip Division ... 109
Potter & Johnston Co. Subsidiary of Pratt & Whitney Division Niles-Bement-Pond Co. .. 73

Republic Steel Corporation 30, 31
Rennolds Wire Division, National-Standard Co. 24
Roebling's, John A., Sons Co. 83

St. Joseph Structural Steel Co. 142
Salem-Brosius, Inc. 17
Scharer, Ray A., & Co. 140
Simonds Abrasive Co. 135
Standard Oil Co. (Indiana) 8, 9
Steel Shot & Grit Co. 139
Superior Tube Co. 71

Thomas Strip Division, Pittsburgh Steel Co... 109
Timken Roller Bearing Co., The, Steel & Tube Division 64

Union Carbide & Carbon Corporation, Bakelite Co. 18
United Engineering & Foundry Co. 87
United States Rubber Co. 20
Upson-Walton Co., The 144

Viking Steel Co. 67

Warner & Swasey 19
Washburn Wire Co. 22
Wash-Rite Co., Inc. 134
Wean Engineering Co., Inc. ..... Back Cover
Weirton Steel Co. 101
Wellman Engineering Co., The 7
Westinghouse Electric Corporation 92
West Penn Machinery Co. 142
Whitehead Stamping Co. 140
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 124
Wilkie Die Products Co. 142

Youngstown Foundry & Machine Co., The 105
Youngstown Sheet & Tube Co., The 14

~ ~ ~

Table of Contents Page 5

Classified Advertising Pages 142, 143